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COMPUTERWORLD

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Networking nexus

Web users gain view of key management data

By Patrick Dryden

Two tool kits slated to debut at Networld/Interop '96 in Atlanta next week will maka management data available across tha Web to any manager with a browser, instead nf only to a complex console, sources tell *Computerworld*.

Translation software from Epilogua Technnlogy and SNMP Research International, Inc. will let managers anywhere nn any platform tap in to the wealth of Simple Netwnrk Management Protocol data embedded throughout their network environment.

Web, *page 16*

For show information, check out the **Networld/Interop Web site** *at www.interop.com*

Switch options multiply, driving user costs down

By Bob Wallace

At Networld/Interop, Cisco, Cabletron and Ipsilon Networks will invade one another's turf with a slew of options for better, cheaper network switching, *Computerworld* has learned.

Cabletron Systems, Inc. will target Cisco Systems, Inc. with a low-end switch, and Cisco will respond with a high-end switch to compete with Cabletron's. Cisco will also announce a switching scheme to rival Ipsilon Networks, Inc.'s Internet Protocol Switching.

Although the prod-

Switches, *page 16*

Intranets get 'pushy'

Intelligent agents limit Web wanderlust

By Kim S. Nash

Not-so-secret agents are popping up from a handful of vendors to help IS fight Web wandering by users who get lost on company intranets.

Intranets are a paradox: They can help some users get data faster, but they can be a real productivity buster for others.

An inventory intranet, for example, may reduce the routine questions warehouse managers get about what is in stock. But making salespeople search an enfamiliar intranet to find out how many brown leather golf bags are at the Camden, N.J., warehouse can eat into time otherwise spent signing deals.

Careful intranet design is one way to reduce World Wida Web wandering (see chart). But so is a means of information delivery known as the "push" model.

Automatically pushing relevant data to end users — via electronic mail or even personalized, dynamic home pages — saves users from having to search for data on their own.

"It's the way of the near-future," said Jerrold Grochow, a consultant at American Management Systems, Inc. in Fairfax, Va.

"We've heard about intelligent agents for years now, but with intranets, we will see it happen," he said.

On the table

A handful of companies are expected to ship push products late this year or early next year. They include the following vendors:

- **Cognisoft Corp.,** a start-up in Redmond, Wash., confirmed that it will ship in January a package that scans corporate databases, documents, the Internet and other data repositories for the information users want. The IntelliServ package then sends the information to users via E-mail, Hypertext Markup Language docu-

Intranets, *page 123*

WHAT'S INSIDE

- Internet congestion is spurring companies tn develop special online carpool lanes. **See story, page 6,** *by Randy Weston and Mitch Wagner.*
- The National Hockey Leagua is skating into cyberspace in a joint venture with IBM. **See story, page 8,** *by April Iacobs.*

- BankAmerica has launched an independant technnlogy unit to help it get products to market faster. **See story, page 12,** *by Thomas Hoffman.*

Directory blocks NT move into enterprise

By Laura DiDio

Microsoft Corp.'s Windows NT Server is undeniably gaining ground as an applications server. But its lack of a full-blown directory service has left corporate America largely committed to Novell, Inc.'s NetWare as the primary enterprise network operating system.

A dnzen customers contacted by *Computerworld*, as well as analysts, consultants and systems integrators, said NT Server usage is on the upswing. But the domain directory structure in Windows NT hampers management and scalability and makes the platform a "no go" for the enterprise (see related story, page 123). Conversely, Novell Directory Services for the enterprise has become the crown jewel of the NetWare 4.x platform.

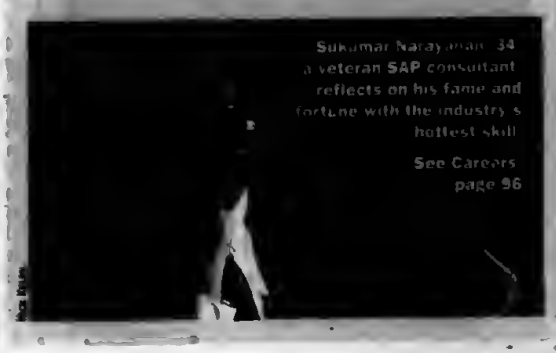
Enterprise servers

"It's a real hindrance. NT Server has a rudimentary implementation that severely limits my ability to view network resources and access information about literally thousands of users," said Gary Wilkerson, program and external services administrator at Kaiser Foundation Health Plan, Inc. in Atlanta.

Win NT, *page 123*

Newspaper

SAP: Ticket to $uccess



Nasty surprises

School lockers and nasty surprises are big topics at my house these days. Of all the things that might obsess my sixth- and 10th-grade daughters during the first week of school, all they talk about is their lockers. You see, the little one got assigned a full-size locker, while her older sister got stuck with a puny, pint-size half-locker. "Is this fair?" cried the sophomore. "Who promised you fair?" shrugged the sixth grader.

Users of Micron's Millennia TransPort notebook PC probably feel closer to my sophomore's dismay these days. They recently discovered a nasty surprise feature in their systems (see story, page 6). If the machine is inserted in its docking station while its power is suspended, it shuts down for up to 24 hours.

"You might not even know that your computer is on but in the suspended state," says Glenn Roberts, a senior principal engineer at Mitre in McLean, Va. Roberts' boss recently found that out when he left his TransPort notebook docked in suspended mode a few hours before he had to take it on a business trip. Surprise! No power.

Also on the nasty surprise list this week are the "hostile applets" that are causing ripples in corporate IS shops (see stories, pages 54 and 68). Companies such as Boeing and the U.S. Defense Intelligence Agency have gone so far as to ban users from downloading Java applets from the Web.

Fortunately, there are plenty of sensible remedies to fix or cope with hostile applets (see chart, page 54), such as setting up a secure repository on a machine not connected to your network.

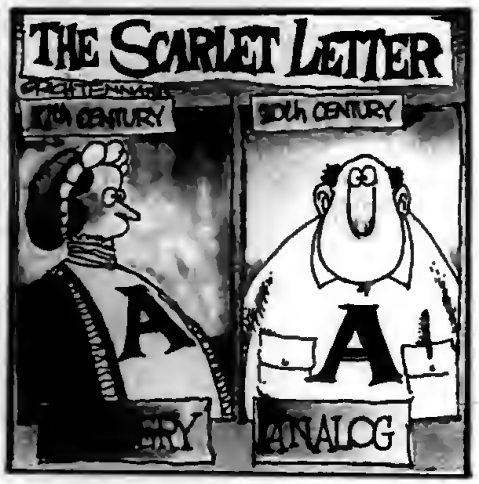
And since we're talking networks, let's not overlook this nasty surprise candidate: Windows NT Server. As our Page 1 story details, users have found that the current domain directory structure in NT hampers management and scalability — which makes the Microsoft platform a "no go" for the enterprise when compared with Novell's NetWare (see related story, page 123).

"I've got a huge investment in NetWare," one user points out. "What do I gain by ripping it out and switching to NT Server?"

Kind of like trading in the big locker for the half-pint model — and even my sixth grader knows better than to fall for that.

Maryfran Johnson, Executive editor
Internet: maryfran_johnson@cw.com

The 5th Wave by Rich Tennant



Apple beefs up server offerings

By Lisa Picarille

Reaffirming its commitment to enterprise customers, Apple Computer, Inc. will kick off the fall by dishing up workgroup and network servers and showing off a prototype of its first SMP server at this week's Seybold Publishing show in San Francisco.

Additional power

The computer maker's new systems — the Mac OS-based Workgroup Server 8550/200 and 7250/120 and the AIX-based Network Server 700/200 — offer Macintosh users more processing power and a defensible reason to stick with the Macintosh as an enterprisewide platform.

The servers come just as reports are resurfacing that some corporate accounts are dropping the Macintosh.

The latest addition to Apple's Network Server family is based on a 200-MHz 604E PowerPC processor. The system, aimed at the publishing, entertainment and education environments, starts at $16,129 and is due next month.

For users of the existing Network Server 500/132 and Network Server 700/150, a 200-MHz CPU Upgrade Card is also expected later this year.

The Cupertino, Calif., company is also prepping a symmetrical multiprocessing (SMP) network server. Apple's first SMP server system is due early next year and will feature two 200-MHz PowerPC 604E chips.

The Workgroup Servers, due later this month, include the Workgroup Server 8550/200, with a 200-MHz PowerPC 604E processor, and the Workgroup Server 7250/120. The Workgroup Server 7250/120 will cost between $2,799 and $3,649; the 8550/200 is expected to cost between $5,799 and $7,399.

News Shorts

IBM, Acer talk PC turkey

IBM is in serious talks with Taiwan's Acer Group to sell Acer-built PCs under the IBM logo, according to sources familiar with the talks. IBM officials wouldn't confirm the discussions, but officials at Acer said the two companies are talking. Under the proposed $2 billion deal, Acer would build consumer PCs for IBM, which has struggled in that market, sources said.

PointCast upgrade set

PointCast, Inc. in Cupertino, Calif., today is due to announce an upgrade to its PointCast Network screen saver for collecting news from the Internet. The company is expected on Oct. 15 to outline plans to add audio and video capabilities to its text-only news feeds. New to PointCast Network 1.1, is a compression feature that cuts by half the amount of bits sent across the Internet. Version 1.1 also lets users customize the categories of news to be received.

IS on hurricane alert

The third major hurricane of the season struck Cape Fear, N.C., with winds up to 120 mph. As of noon last Friday, there were 28 active alerts filed by subscribers to Comdisco Disaster Recovery Services in Rosemount, Ill., company officials said.

Cabletron supports app

Cabletron Systems, Inc. this week will help users of its Spectrum network management platform take care of systems and applications by selling and supporting AppControl, a policy-based applications manager for Unix systems. The new version adds options for monitoring system tasks, distributing software and tracking Web server functions. AppControl costs $15,000.

City repeals Internet tax

The Tacoma, Wash., City Council last week repealed a 6% sales tax on Internet service providers' gross receipts. Opponents argued that the tax, which would extend a telephone line tax to Internet providers, is already being paid because the providers and their customers use phone lines.

Web ad income soars

World Wide Web advertising revenue soared 83% in the first half of the year, and the Internet is on track to become a $5 billion-per-year commercial medium by 2000, according to research firm Jupiter Communications, Inc. Ad spending totaled $71.7 million in the first half of the year and will balloon to $312 million for the year as a whole, Jupiter officials estimated last week. The firm forecast near-triple-digit annual growth for next year.

Bay buys modem maker

Bay Networks, Inc. in Santa Clara, Calif., last week bought LANCity Corp., an Andover, Mass., cable-modem maker for $59 million. Internetworking companies are eyeing the cable-modem business. Only 25,000 cable modems are in use, but analysts expect the market to grow to more than 1 million in the next few years.

Lotus ships E-mail ware

Lotus Development Corp.'s Soft-Switch division shipped Mail Monitor 2, software that tracks message flow among different electronic-mail systems. It costs $15,000. Soft-Switch has also revised its X.500 directory plans; it has changed the product name from Lotus Pages to the Soft-Switch Directory Publisher.

'net browser chokes

Microsoft Corp.'s Internet Explorer 3.0 is choking on Java applets that will work with other World Wide Web browsers. Microsoft last week said Explorer 3.0 can't run applets whose files have names that don't exactly match their contents, and that some Version 3.0 users who upgraded from beta versions of Explorer may encounter errors caused by missing Java class libraries. Users can download those libraries at www.microsoft.com/java.

SHORT TAKES PeopleSoft, Inc. last week purchased Red Pepper Software, Inc., a maker of supply chain management and scheduling software. ... MCI Communications Corp. has won a $400 million, three-year contract to provide network switching and management services to the Defense Information Systems Agency worldwide. ... Novell, Inc. will unveil GroupWise 5.0, its upgraded electronic-mail and groupware product, in New York this week.

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Closer ties to the Internet and Windows 95 ***are the strong points in NT 4.0. Lack of Plug and Play and inadequate documentation are drawbacks, a hands-on review shows.*** **Buyer's Guide, page 89**

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Columnist David Coursey has some advice for Novell:

"Don't hire another CEO. Put yourself on the block while you still can." His most likely picks for buyers – Netscape, 3Com, Cisco or EDS. **See page 125**

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Keep the traffic moving

Reserved bandwidths help clear congested intranet arteries

By Randy Weston and Mitch Wagner

Virtual carpool lanes reserved for corporate intranet traffic are popping up on the Internet. Vendors hope the reserved bandwidth will speed up the flow of priority transmissions through the increasingly sluggish global network.

For example, PSInet, Inc. in Herndon, Va., this week plans to introduce a premium corporate Internet service said to provide improved throughput and availability compared with standard Internet service, *Computerworld* has learned.

And Diamond.Net, a St. Louis start-up, is building an Asynchronous Transfer Mode (ATM) network designed to skirt the Internet's congested main hubs — the Metropolitan Access Exchanges and network access points.

Avoiding those hubs enables information sent on the Diamond.Net backbone to travel 30% faster, said Andrew Gladney, president of Diamond.Net. Using ATM technology increases the speed another 40%, he said.

Diamond.Net offers its service at a standard rate; PSInet charges an additional premium of about 25% for the dedicated bandwidth service.

"As the uses of the Internet are increasingly discovered by businesspeople, they are demanding these kinds of services," said Brian Sroub, vice president of marketing at Hearst New Media Technology, a division of Hearst Corp. "When both coasts are at work, those are really peak hours. Whatever we can do to maintain the [level of] service at that time, we'll do. We don't want to have an AOL [blackout] situation [CW, Aug. 12]. We'll be very happy to see that not happen as we try to get the medium going."

Analysts agreed the offerings are a small step toward an end that Internet industry observers have foreseen for months: premium service that will offer guaranteed throughput for high-priority traffic.

What guarantees?

"It's being driven by business needs," said Jay Pultz, an analyst at Gartner Group, Inc. in Stamford, Conn. "Although the Internet can get you anywhere and everywhere, the problem [for businesses] is guaranteed levels of service."

The new PSI Intranet service tackles that issue by guaranteeing a user space on PSInet's international switch network. The company will give priority treatment to PSI Intranet traffic, which PSInet said will improve performance — but it won't offer any guarantees on performance.

Most of PSInet's competitors offer "virtual private Internet" services in which subscribers share the Internet service provider's router network with the other high- and low-priority traffic the provider carries, said Jeffrey Shapard, senior product manager of corporate services at PSInet. By comparison, the PSI Intranet traffic will ride on a portion of the PSI network devoted only to PSI Intranet traffic — like a carpool lane on a highway, in which fewer cars are allowed in the lane so traffic moves faster.

Diamond.Net guarantees service only along the routes it manages. A transmisson that leaps onto another carrier's backbone isn't guaranteed. Gladney said he promises customers that if any section of the Diamond.Net network reaches 30% sustained usage, the company will increase the bandwidth, either by upgrading its own network or leasing more space from another vendor.

Bandwidth isn't an issue for Peters Securities, a fledgling online stock trading firm. But it was important that the company sign with a service provider that could guarantee enough bandwidth to meet the company's immediate needs and that also could adapt quickly to the company's growth.

"Big companies can't change on a dime," said Trevor Wisniewski, Peters Securities' MIS director. "We set up with Diamond.Net because we can have a reliable intranet or Internet backbone."

The price of service

Company	Service	Price per month
Diamond.Net	T1	$1,300
PSInet Intranet	T1	$2,895*

*PSInet's standard T1 connection is $2,295

Lane-jumping woes

One of the biggest performance problems faced on the Internet comes about because most traffic on it doesn't stay on a single Internet service provider's backbone — it travels between two or more of the 100,000 networks that comprise the 'net.

Performance agreements among the largest Internet service providers could help alleviate that problem, and the providers are working toward just that. They are talking among themselves to try to guarantee performance to users for messages traveling among their networks. Those providers include BBN Planet, MCI Communications Corp., Sprint Corp., PSInet and ANS, an America Online Company [CW, May 27]. The vendors expect the talks to see fruition by year's end. — *Mitch Wagner*

Micron's notebooks leave some users in suspension

By Justin Hibbard

Some users of Micron Electronics, Inc.'s Millennia TransPort notebook are finding themselves frozen out thanks to a nasty surprise feature in their systems. If the notebook is inserted in its docking station while its power is "suspended," the system shuts down for up to 24 hours.

Mobile computing

A label on the MicronDock docking station and instructions in the documentation warn users not to dock the system while it is on. Nevertheless, several users have inadvertently docked the system while it was suspended — a state in which the screen dims and the system partly shuts down to conserve power.

"You might not even know that your computer is on but in the suspended state," said Glenn Roberts, senior principal engineer of information technology architecture at Mitre Corp. in McLean, Va. Roberts said his supervisor recently rendered a TransPort notebook useless by docking it in suspended mode a few hours before a business trip.

"This is going to give us pause unless they fix this problem," Roberts said. "I know that if you bought this, within a week, 10 people would have done this."

It took less than a week for Ted Coolidge. "I did it almost as soon as I owned the thing," said Coolidge, a technical support engineer at PowerSoft Corp. in Cambridge, Mass. Although he read the warning, Coolidge docked his suspended notebook while he was distracted. "I guess I spaced out," he said.

Computerworld is also a user of the Micron laptops.

Micron employees offered various explanations for the problem. Notebook manager Andy Condon, the most senior employee who spoke to *Computerworld*, said a controller on the motherboard was responsible.

Self-protection

"The controller controls all the power management on the system and shuts down to protect itself," he said. When asked why it took 24 hours for the controller to recover, Condon replied, "It wasn't intended in the original design to handle that situation."

Condon said Micron revised the controller after the notebooks began shipping. The TransPort models now shipping contain a controller that causes the system to turn off if it is hot-docked. The notebook can then be turned on immediately, though data not saved to disk is lost. Condon said it is impossible to determine how many notebooks shipped with the old controller.

Lamont Loveland, the PC engineer overseeing notebooks at Micron, offered a different explanation. He said the TransPort's BIOS software causes the system to shut down when excessive electricity enters from the docking station. "It's a protection in the BIOS to protect [the notebook] from losing anything," he said. The BIOS, which is made by Phoenix Technologies, Inc., takes 24 hours to recover, Loveland said.

The TransPort's inability to connect seamlessly to a docking station isn't unusual, Loveland said. "There's not a system out there today that can do hot docking," he said. The next version of the TransPort's docking station, the MicronDock, will use Intel Corp.'s 380 Dock Set chip set, which enables hot docking.

Officials at Compaq Computer Corp., Toshiba America Information Systems, Inc. and IBM disputed Loveland's statement. All three companies said their notebooks support hot docking, which lets a notebook running applications plug into a docking station.

"We've been doing hot docking for a year and a half now," said Kevin Clark, product manager of mobile computing at IBM. IBM's ThinkPad Dock II, SelectaDock I and SelectaDock II offer hot docking for the ThinkPad 755 series and higher.

Jerry Perdy, an analyst at Mobile Insights in Mountain View, Calif., said hot docking will soon be indispensable. "The ability to hot dock, so that you don't change but the system adapts to you, is going to be really critical," he said.

On the road

Mobile Insights says 68% of mobile workers plan to use a laptop as their primary PC by the end of next year.

Developer/2000 Beats Visual Basic in InfoWorld Tools Comparison

The rigorous InfoWorld Product Comparison recently tested Oracle Developer/2000 and Microsoft Visual Basic to find which one "wouldn't crack under the pressure of scaling to the enterprise." After a battery of tests, InfoWorld concluded: "Our standout winner, Oracle Developer/2000..."

WORLD

InfoWorld Product Comparison Score

Enterprise Development Tools

	Oracle Developer/2000	Microsoft Visual Basic
	7.2	5.1
InfoWorld on Scalability	"Developer/2000 performance... convinced us that it was prepared to scale..."	"...Visual Basic just didn't have... scalability."
InfoWorld on Team Development	"Developer/2000 leads the pack in data-repository-based development."	"We feel this is an area where Visual Basic needs work."
InfoWorld on Database Programming	"Developer/2000 is packed with tools that make it the strongest... in transaction building."	"Visual Basic... transaction-building capabilities weren't ready for enterprise-wide applications."
InfoWorld on Reusability	"We were quite impressed with the wide range of object-reusability tools offered by Developer/2000."	"...Visual Basic's object reusability features (are) inefficient and tedious."
InfoWorld on Productivity	"... Developer/2000 is packed... for productivity. Developer/2000's most notable tool... is its unique drag-and-drop application partitioning capability."	"...Visual Basic... lacked the perks provided by Developer/2000."

For more information and a copy of the report, call Oracle at 1-800-633-1071, ext. 10052 or find us on the Web at http://www.oracle.com

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InfoWorld Product Comparison results as of June 17, 1996.

NHL, IBM shoot for Web success

Stats on ice

The NHL/ICE project features the deployment of the following:

- IBM's real-time scoring system across all 26 league teams. It will let people access detailed, play-by-play game statistics over the Web. Instead of pen and paper, game scorers will use laptops linked to the game clocks.
- A digital library that will serve as an electronic archive that features articles, photographs and audio- and videotapes of games.
- NHL OpenNet, a Web site that will feature real-time scoring, event coverage and merchandise. It will be open for the 1996-97 season and will be enhanced throughout the year.

— *April Jacobs*

By April Jacobs

With professional hockey's 80th season around the corner, IBM and the National Hockey League (NHL) are skating into cyberspace with a joint venture to deliver hockey games and paraphernalia to fans worldwide.

Over the next year, the NHL and IBM will set up an online scoring system — just one part of the NHL Interactive Cyberspace Enterprises (NHL/ICE) project. A World Wide Web-based service will let fans watch cybercasts of games, search for information on their favorite players and purchase merchandise.

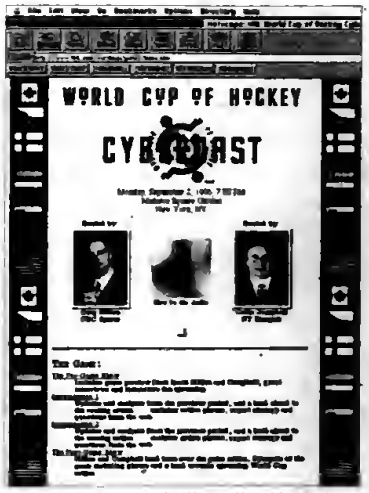
A digital library of audio and video clips will be put online over the next two years.

The NHL, long viewed as less savvy than other professional sports leagues, wants to use the online venture to update its image and expand its presence into the international arena.

Fresh off its stewardship of the Atlanta Olympic Games, IBM plans to make money from the NHL venture via access fees on a Web-based hockey information service and commissions on NHL merchandise sold online.

IBM already provides scoring and Web sites for the Professional Golfers Association and servers and data mining for the National Basketball Association.

Trying to win new fans and make money on the Internet may be the latest trend in sports. The Dallas Cowboys late last week announced an Internet offering designed to allow fans to see games and get information about the team.



The NHL's Web site *will offer audio, video and statistics to fans and team coaches*

Hockey analyst and SportsChannel commentator Stan Fischler said NHL/ICE is in line with NHL Commissioner Gary Bettman's plan to spread the gospel about hockey and bring more attention to it.

"It's more indirect than direct," Fischler said. But he added that "this whole project is going to put the NHL a little bit above the competing sports," including football, baseball and basketball.

Bettman said fans want more audio, video and statistics, which they will get from the site (www.nhl.com).

Coaches can also use the system to their advantage, NHL Chief Operating Officer Steve Solomon said. They will be able to pull down playbacks of games to focus on players' strengths and weaknesses. And the scoring system — a paper-and-pencil operation since 1917 — will be updated to provide useful details.

"We needed to have a system with hockey smarts ... and give our teams statistical data they could use," Solomon said.

Out of the penalty box

The NHL will contribute content and its name; IBM will build the system, providing hardware, software and technical investments that cost millions of dollars, officials said. The setup will include laptops for the scoring system, IBM's digital library technology and its Global Network Services.

The project could offer a touch of redemption to IBM, which is only now emerging from the penalty box after technical and planning snafus derailed some of its systems at the Olympic Games in Atlanta this summer. A successful deployment for the NHL could be an image booster, and Bettman said he has full confidence in IBM, which first showed him a prototype almost two years ago.

IBM and the NHL will make sure everything works before the system is rolled out, said Bettman, who added that he wants to see it in operation before the start of the next hockey season.

Visa ceiling bars foreign programmers

Doors reopen with fiscal year, Oct. 1

By Sharon Gaudin

Intersoft Technologies, Inc. is up against deadlines for two software contracts, but the foreign programmers it hired to do the job can't get into the U.S.

Without the three workers, Intersoft may miss its first deadline and face a $200,000 late fee.

For the first time ever, the number of professionals seeking temporary work visas in the U.S. exceeded the annual cap of 65,000 before the end of the fiscal year.

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"Just getting a visa is not the end of the story," he said. "A month of [government] delay ends up being two months of delay for us."

Intersoft's CEO Rajan Zambre: *'A month of [government] delay ends up being two months of delay for us'*

The H-1B visas cover all types of professionals, from computer specialists to fashion models. About 2,500 of the 55,000 H-1B visas granted last year were for computer specialists, mostly programmers.

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Now that the cap has been reached, companies have to decide whether to hire someone less qualified or wait to hire the best talent from abroad, Johnston said.

Critics say hiring low-cost foreign programmers under the H-1B program displaces U.S.-born programmers at software vendors and corporate information systems departments (CW, Dec. 4, 1995).

A spokesman for the Washington-based AFL-CIO labor union said he hopes the cap will motivate companies to look for help in their own backyards instead of searching for cheap foreign labor.

Less than 1% at Intel

Businesses such as Intel Corp. countered that they only hire foreign computer specialists to get advanced skills that aren't available in the U.S. The Silicon Valley company hired about 10,000 employees in a job spurt last year, but fewer than 100 were immigrants, according to Intel officials.

Johnston said the five-week visa stall may make companies consider more offshore software development. "They need to prepare for next year in case those five weeks jump to two or three months," he said.

Ed Yourdon, a New York-based software consultant and author of *The Decline and Fall of the American Programmer*, agreed. "If [companies] can find competent but much lower-priced software people in India or Russia or the Philippines, that's a big attraction," he said.

At the limit

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1993	61,000
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NHL, IBM shoot for Web success

By April Jacobs

With professional hockey's 80th season around the corner, IBM and the National Hockey League (NHL) are skating into cyberspace with a joint venture to deliver hockey games and paraphernalia to fans worldwide.

Over the next year, the NHL and IBM will set up an online scoring system — just one part of the NHL Interactive Cyberspace Enterprises (NHL/ICE) project. A World Wide Web-based service will let fans watch cybercasts of games, search for information on their favorite players and purchase merchandise.

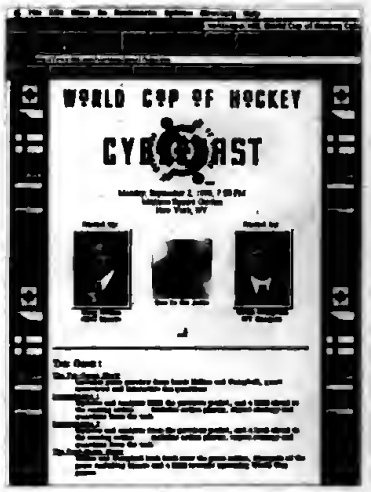
A digital library of audio and video clips will be put online over the next two years.

The NHL, long viewed as less savvy than other professional sports leagues, wants to use the online venture to update its image and expand its presence into the international arena.

Fresh off its stewardship of the Atlanta Olympic Games, IBM plans to make money from the NHL venture via access fees on a Web-based hockey information service and commissions on NHL merchandise sold online.

IBM already provides scoring and Web sites for the Professional Golfers Association and servers and data mining for the National Basketball Association.

Trying to win new fans and make money on the Internet may be the latest trend in sports. The Dallas Cowboys late last week announced an Internet offering designed to allow fans to see games and get information about the team.



The NHL's Web site *will offer audio, video and statistics to fans and team coaches*

Hockey analyst and SportsChannel commentator Stan Fischler said NHL/ICE is in line with NHL Commissioner Gary Bettman's plan to spread the gospel about hockey and bring more attention to it.

"It's more indirect than direct," Fischler said. But he added that "this whole project is going to put the NHL a little bit above the competing sports," including football, baseball and basketball.

Bettman said fans want more audio, video and statistics, which they will get from the site (www.nhl.com).

Coaches can also use the system to their advantage, NHL Chief Operating Officer Steve Solomon said. They will be able to pull down playbacks of games to focus on players' strengths and weaknesses. And the scoring system — a paper-and-pencil operation since 1917 — will be updated to provide useful details.

"We needed to have a system with hockey smarts ... and give our teams statistical data they could use," Solomon said.

Out of the penalty box

The NHL will contribute content and its name; IBM will build the system, providing hardware, software and technical investments that cost millions of dollars, officials said. The setup will include laptops for the scoring system, IBM's digital library technology and its Global Network Services.

The project could offer a touch of redemption to IBM, which is only now emerging from the penalty box after technical and planning snafus derailed some of its systems at the Olympic Games in Atlanta this summer. A successful deployment for the NHL could be an image booster, and Bettman said he has full confidence in IBM, which first showed him a prototype almost two years ago.

IBM and the NHL will make sure everything works before the system is rolled out, said Bettman, who added that he wants to see it in operation before the start of the next hockey season.

Visa ceiling bars foreign programmers

Doors reopen with fiscal year, Oct. 1

By Sharon Gaudin

Intersoft Technologies, Inc. is up against deadlines for two software contracts, but the foreign programmers it hired to do the job can't get into the U.S.

Without the three workers, Intersoft may miss its first deadline and face a $200,000 late fee.

For the first time ever, the number of professionals seeking temporary work visas in the U.S. exceeded the annual cap of 65,000 before the end of the fiscal year.

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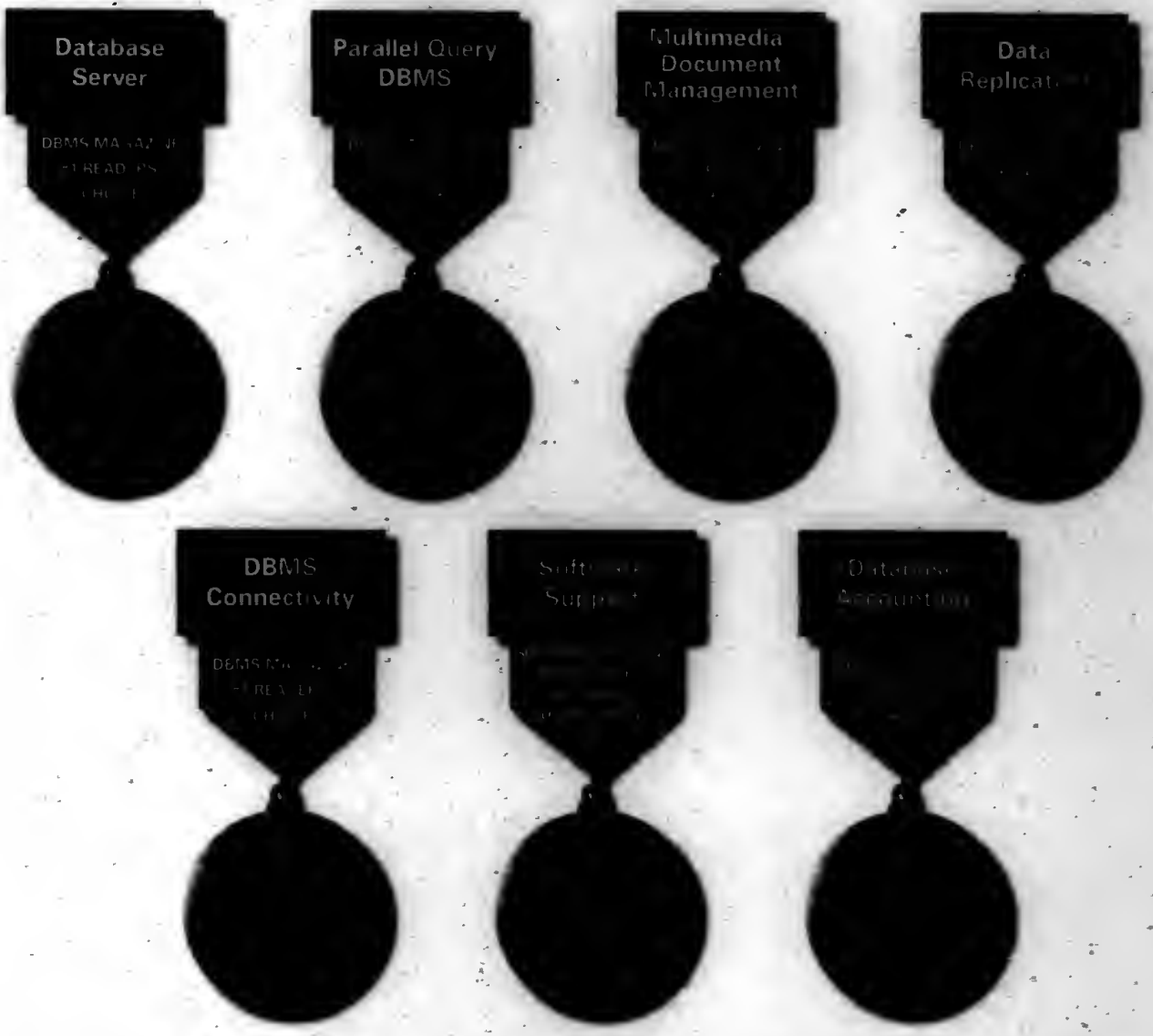

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Add-on tweaks Visual C++ for client/server

By Frank Hayes

Hoping to bridge the gap between C++ and corporate information systems departments, Blue Sky Software Corp. this week plans to roll out an add-on that will make Microsoft Corp. Visual C++ easier to use for developing client/server applications.

Officials at the La Jolla, Calif., company said Visual SQL 4.2, which costs $1,499 and runs under Microsoft's Windows 95 and Windows NT, adds a set of visual tools for database access and other functions. The tool set lets developers use a mouse to create data-access code, then automatically generates 32-bit Visual C++ code for applications. Those drag-and-drop tools are aimed at making Visual C++ more like Microsoft's Visual Basic and Powersoft Corp.'s PowerBuilder.

"Visual SQL brings a lot of the functionality that I've seen in Visual Basic into the Visual C++ development environment," said Ken Henderson, chief technical officer at SunOpTech, Inc. in Sarasota, Fla. "It takes Visual C++ down the path that an MIS director would want."

C++ has largely been rejected by corporate IS shops because of its reputation for producing code that is complex and difficult to maintain. But some C++ vendors continue to update their C++ visual development systems in hopes of answering those concerns. Sybase, Inc. last month announced an improved version of its Optima++ visual tool set for C++ that borrows data-access capabilities from PowerBuilder.

In July, Rogue Wave Software, Inc. rolled out an improved version of its Zapp C++ visual tool set. And IBM has beefed up its VisualAge for C++.

How successful have those efforts been? Products such as Optima++ close about 60% of the gap between ordinary C++ and visual development environments, said Chris Kwiecinski, senior systems developer at Nabisco, Inc. in Parsippany, N.J. "It's coming closer, but it's not there yet."

The C++ visual tool sets can also serve as a learning tool, even for experienced C++ developers, said Henderson, who has tested Visual SQL. "This tool generates excellent, very logical C++ code using the Microsoft Foundation Class library," he said.

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AT&T

Path from Mail to Notes delayed

By Tim Ouellette

Lotus Development Corp. seems better at keeping its users in the fold than pillaging competitors' camps.

Officials at the Cambridge, Mass., company said shipment of tools for migrating Microsoft Corp. Mail users to Notes — originally promised for May — has been pushed back to later this year. Lotus has already shipped tools for CC:Mail migration.

The tools simplify the movement of user electronic-mail messages, attachments, directories and folders to a Notes system.

Stuck in the middle

Microsoft Mail shops that are considering Notes must wait or try homegrown schemes. "We are more or less in limbo," said a user at a large health systems firm, who asked to remain anonymous.

About 200 of the firm's 1,000 employees use Mail and are waiting for a smooth switch to Notes.

"I give up. I'm migrating my [Mail] users to Microsoft Exchange," said Alham Sumudra, an E-mail manager at Satelindo, a telecommunications company in Jakarta, Indonesia. Analysts said most users who move to Notes will come from Lotus' 10 million CC:Mail user base, whereas the 9 million users of Microsoft Mail are more inclined to move up to Exchange [CW, April 28].

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'net aids Red Cross

Online site kept workers updated on Hurricane Fran

By Stewart Deck

As Hurricane Fran battered the mid-Atlantic coast with 130-mile-per-hour winds and torrential rains, the American Red Cross' online technology was abuzz with storm updates and preparations.

The World Wide Web site (www.redcross.org) featured weather maps from the National Weather Center and the National Hurricane Center, along with preparation measures for violent storms and shelter information.

The internal Red Cross intranet, ARC Online, flashed with news articles and alert status reports from various regions. This is the intranet's first hurricane season, and regional offices in Pennsylvania and Virginia posted information on how many vehicles and supplies they could send to hard-hit areas if they were needed.

The idea behind ARC Online is to connect each of the 1,500 Red Cross offices across the U.S. by next July so that information and updates can be passed along quickly and effectively. To date, more than 400 regional offices are part of the system. Instead of painstakingly mailing or faxing several procedure updates every week, the central office in Falls Church, Va., now posts the updates on ARC Online and the regional offices download them.

"We tried using a commercial fax distributor for sending bulletins to each office, but that became extremely expensive," said Rex Costanzo, director of systems development at the Red Cross. "Our intranet has already saved us a lot of money."

Direct contact

The Red Cross' external Web site was designed to provide direct services to people in need, increase the organization's visibility and "generate money, volunteers and blood and tissue resources," Costanzo said. Active for two years now, the Web site can accept donations by credit card.

More organization-specific information is passed along through ARC Online.

Chapter offices, paid staff and more than 4 million Red Cross volunteers can receive the ARC Online software packet that connects them to the system through HLC Internet, Inc., an Irvine, Calif., Internet service provider.

"The Red Cross already has a tremendous network of volunteers and offices. This is a way to extend that on to a computer network," said Jeff Varnes, executive director of the York, Pa., American Red Cross chapter.

In addition to disaster updates, each chapter will use the ARC Online intranet to update its policy and information bulletins, management memos and events calendars. It also keeps far-flung offices updated on technology upgrades and congressional bills that affect the Red Cross.

The most popular section of ARC Online has been the discussion forums, said Maribeth Luftglass, manager of systems development at the Red Cross. The forums have information on health and safety trends, recruitment services, biomedical and nursing issues and the status of alerts.

Mac clones may bundle BeOS

By Lisa Picarille

Beginning in January, users who purchase Macintosh clones from Power Computing Corp. may have a choice of operating systems — the Mac OS or the BeOS.

According to sources close to both Power Computing and Be, Inc., the two companies are in discussions that could result in a BeOS bundle on all of the Round Rock, Texas, computer maker's systems.

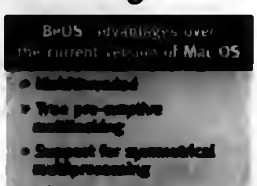
"The deal is imminent," claimed one source briefed on the talks.

Jean-Louis Gassee, Be's chairman and CEO, confirmed the talks but said, "We have not reached a definitive agreement."

Big steps

Power Computing had previously helped Be port the BeOS from the proprietary BeBox hardware to the PowerPC chip. The two companies demonstrated a version of the BeOS running on a Power Computing machine at Macworld Expo/Boston in August.

But a bundling deal would take the relationship a step further and


BeOS advantages over the current version of Mac OS
• Multithreaded
• Uses pre-emptive multitasking
• Support for symmetrical multiprocessing
• Object-oriented for easy application development

offer Be some leverage and distribution clout for its upstart operating system. Power Computing reportedly has sold more than 130,000 units since its first Macintosh-compatible debuted a year ago, according to industry sources.

Users who saw the Macworld demonstration of the BeOS running on Power Computing's Macintosh clone were impressed, but skeptical of a new operating system.

"I was kind of surprised that someone would come out with another operating system," said Joel Kitchen, Macintosh network coordinator at Publix Super Markets, Inc., a grocery store chain in Lakeland, Fla. "It's a gutsy move on Be's part. I hope they are successful. The more competition the better it is for users. Up to now, it's been a two-horse race."

In addition, the exposure from a deal with Power Computing may cause Apple Computer, Inc. to take a closer look at the BeOS as a viable alternative to its struggling Mac OS effort [CW, Sept. 2].

Apple's interest

The BeOS offers a host of things that Apple's next-generation Copland operating system was supposed to deliver before it was scrapped in favor of a new operating system release strategy. Because of that, Apple has expressed interest in acquiring the BeOS, according to sources inside Apple.

"I don't know why Apple doesn't just buy the BeOS and call it Mac OS 8 and be done with it," said Dave Winer, a longtime Macintosh developer who is committing resources to create Windows and BeOS versions of his Frontier scripting language.

For more information on what Be brings to the operating system party, with or without Apple, see www.computerworld.com.

Bank America branches out

Subsidiary to develop reusable object templates for financial firms

By Thomas Hoffman

BankAmerica Corp. last week created an object-oriented software development subsidiary to help it bring bank products to market faster.

The 15-person unit, called Concorde Solutions, Inc. in Concord, Calif., will develop reusable object templates for the bank and for possible resale to other financial service companies.

BankAmerica's Marty Stein *says object technology will help the bank 'be a leader' in new product development*

Marty Stein, BankAmerica vice chairman and technology chief and chairman of Concorde, said the subsidiary plans to use cutting-edge object tools to help the bank become a leader in developing new financial products and services. The first two internal applications are expected in mid-1997.

BankAmerica has invested "a few million dollars" to form Concorde, said Isaac Applbaum, the subsidiary's president. The investment is separate from BankAmerica's $1 billion-plus annual information systems department budget.

Driving force

There are several business drivers behind Concorde's flight. For instance, the "massive" maintenance workload for BankAmerica's legacy systems makes it difficult for the bank's programmers to develop new systems and products quickly, Applbaum said.

To attract the industry's top object developers, San Francisco-based BankAmerica also wanted to create an entrepreneurial setting that wouldn't spook "T-shirt-and-jeans programmers from working for a Fortune 500 company," Applbaum said.

He also said the two organizations will share work on some projects to ensure Concorde's staff isn't completely polarized from BankAmerica's IS group.

For Concorde to succeed, BankAmerica "will have to embrace the unit and not leave these guys dangling out there like a bunch of kooks," said Art Gillis, president of Computer Based Solutions, Inc., a Dallas-based banking consultancy.

Gillis and other analysts pointed to Citibank as a noteworthy example of a bank that tried — and failed — to launch an independent technology unit a few years ago.

One of Concorde's first internal projects is to build a relationship management system for corporate or wholesale customers. BankAmerica already has several IBM mainframe-based wholesale systems to support its customers, but the character-based IBM 3270 "green screens" severely limit the ability of customer representatives to cross-sell additional products, Concorde officials said.

The new wholesale system, which enters the pilot phase in November, will be built using IBM's System Object Model tools to connect customer service representatives to legacy data. That way if someone at, say, Coca-Cola Co. calls BankAmerica about a wire transfer, a customer representative can check Coca-Cola's portfolio for other on-the-spot investment opportunities the bank can offer, Applbaum said.

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Net computer, IBM-style

Network Station could help IS make order of network chaos

By Michael Goldberg

IBM last week introduced Network Station, a light, thin $700 machine for business users that is the company's answer to this year's network computer buzz.

Users said Network Station looks more practical than visionary — something that could, with more work, help taxed information systems managers modernize and control their unwieldy fields of corporate desktops.

Network computer

Server link

Network Station comes with Netscape Communications Corp.'s Navigator World Wide Web browser and other software that lets it send and receive information, including Java applets, from servers. The device doesn't store information or programs such as a spreadsheet. Instead, it accesses those capabilities from the server.

Users said they are interested in Network Station because managing PCs in a corporate network can be like raking fallen leaves in a stiff breeze: difficult to gain orderly control.

"Particularly when we start talking about Web browsers, that unit is clearly an advantage over PCs. We don't have to change the browser on every desk all the time. And I don't have to worry about some user adding Microsoft Golf on their system," said Kent Polzin, director of technical operations at mattress manufacturer Simmons Co. in Atlanta.

Analysts used IBM's announcement to caution against the industry hype over network computers. They said Network Station is a good replacement for the estimated 30 million dumb terminals still connected to data-entry shops that use IBM mainframes and AS/400 minicomputers.

Its potential as a powerful networking device still remains to be seen.

Java key

John Logan, an analyst at Aberdeen Group, Inc. in Boston, said Network Station's Java applet support could mean a lot a year from now. "If application development environments accept Java, as they appear to be doing, it's well-positioned to run Java applets at this low cost, and it [could] allow access to the Web for electronic commerce," Logan said.

Some software vendors are working on this now. Software 2000, Inc. in Hyannis, Mass., which sells financial and human resources software for AS/400 users, is working to put some simple Java enablement into its products for release when Network Station is available in the fourth quarter, according to company chairman Bob Pemberton.

Paul Dunn, manager of technical services at Les Schwab Tire Centers, Inc., an AS/400 shop in Prineville, Ore., said he can see the potential of using Java applets on Network Station.

"It can become a [more powerful device] using some object-oriented tools to develop applications to run on it, [such as] Java applications. The price could potentially make it worthwhile," he said.

PC support costs bedevil IS

By Bob Francis

Frustrated by the cost of supporting desktop PCs, some information systems managers are taking a look at network computing devices as an alternative.

These devices don't seem to be affecting PC sales, but some managers are using them in place of PCs on their networks, citing lower support costs as a primary factor.

"We can use these devices for a variety of applications on the network, and yet we don't have the support costs associated with PCs," said Manual Roy, an IS manager at Blue Cross/Blue Shield of Florida in Miami.

Source: Gartner Group, Inc., Zona Research, Inc. and HDS Network Systems, Inc.

Reasons to switch

Roy cited the fact that these systems can handle legacy and PC applications and still be controlled from a central server as primary reasons for using the 100 or so network computing devices from HDS Network System, Inc. in King of Prussia, Pa. "With PCs, we have to go out to the system to make a lot of the changes," he said.

First foray

Compaq Computer Corp. first added sophisticated management features to desktop PCs in March 1995.

Last week, IBM got in the network computing device game, announcing a product designed for its AS/400 systems (see story above).

IS managers have struggled to get PC costs under control for some time. "From where I sit, the actual hardware isn't the big cost of the PC — it's getting someone to set it up and configure it and make sure it's operating right," said James McCullough, MIS director at Delta Air Lines in Atlanta.

In response, the PC vendors are planning a frontal assault on PC management costs, led by the industry's primary chip manufacturer, Intel Corp. in Santa Clara, Calif.

Intel, which has become the primary motherboard vendor to the PC industry, plans to incorporate several new monitoring and management features on future generations of its motherboards.

Motherboards are the basic building blocks of desktop PCs, housing the microprocessor and connections for the hard drive, memory and add-in cards.

Intel's counterattack

This week, Intel will announce a product that will be incorporated into LANDesk, its desktop PC management software. Scheduled for release later this year, the configuration management technology will allow IS managers to perform PC installation, configuration and upgrades over the network, even if the PC has been turned off.

This new capability should help lower the cost of PC management because most IS managers have to deploy personnel to perform these tasks on-site.

"If IS managers can do some of these tasks centrally, it should help lower their costs," said Brian Burba, an analyst at International Data Corp. in Framingham, Mass.

IBM to expand global 'net commerce services

By Mitch Wagner
SAN FRANCISCO

IBM this week plans to announce an agreement designed to enhance its ability to connect companies for international commerce over the Internet, *Computerworld* has learned.

Big Blue will announce a joint marketing and technology-sharing agreement with Global Business Alliance, Inc., an 80-person Washington company that specializes in international electronic commerce, IBM executives said.

Global Business Alliance runs the Unibex network, a global private network that uses Internet protocols. It also offers an array of services for translating data among countries' data-interchange protocols.

Global Business Alliance offers translation services for individuals as well; it translates electronic mail and other digital communications among different natural languages.

Time has come

"They've been thinking about the problem of international electronic commerce for years, since before there was an Internet," said an IBM official, who requested anonymity. IBM expects to announce the alliance at this week's Internet Commerce Expo in Anaheim, Calif., sponsored by International Data Group, parent company of *Computerworld*.

IBM declined to comment officially.

Unibex was announced 18 months ago, under the name Ibex, as an alternative to the Internet [CW, April 3, 1995]. Global Business Alliance has since been working to integrate Internet technology into the network. Global Business Alliance, which has about $10 million in capital, is backed by the U.S. Chamber of Commerce, AT&T Corp., The Dun & Bradstreet Corp., Digital Equipment Corp., Microsoft Corp. and others.

Many options

IBM officials said the company will use the Unibex network as another option for its customers. The company will be able to connect users to the public Internet, IBM's private Advantis network or the Unibex network — based on the customer's preference — in much the same way as IBM now offers multiple operating systems.

IBM last week announced an array of Internet commerce services under the umbrella name CommercePoint. They are targeted at retail sales on the Internet and business-to-business sales. The services were designed to give merchants a safe and reliable means of accepting payments, taking orders and posting product catalogs online.

America Online spam ban lacks teeth

By Mitch Wagner

It was a nice gesture, but it doesn't mean much beyond that.

America Online, Inc. last week announced that it is nailing a "Keep Out" sign on its gates, which is aimed at bucksters flooding America Online users with unwanted bulk electronic mail.

AOL, the largest online service in the country, made a high-profile statement declaring Internet junk mail unacceptable and implemented technology measures to block it from subscribers.

AOL's E-mail ultimatum has considerable publicity value. But the specific measures proposed by AOL are common practice on the Internet. And they don't work. They rely on screening out E-mail from particular addresses and domains. But spammers move around, changing addresses and domains specifically to avoid the kinds of blocks being implemented by AOL.

Spam slam

Junk E-mail is often known as "spam." It's generally believed that the name comes from a *Monty Python's Flying Circus* comedy skit, where players dressed in Viking costumes and loudly chanted "Spam! Spam! Spam!" — drowning out attempts at conversation.

"Receiving unsolicited junk E-mail is the No. 1 complaint we hear from our members," Steve Case, chairman and CEO at America Online, said in a written statement last week. The firm said it is contacting organizatioos that send its members junk mail to ask them to stop. The worst offenders will see their E-mail rejected by AOL's systems before it reaches users. And AOL Thursday introduced free filters designed to allow users to configure which mail to automatically reject.

The move comes as Internet users have recently been complaining more and more about junk mail — often known as "spam" — in their Internet and online service E-mail boxes. The junk mail often advertises pornography, online sex sites, cheap computer equipment and get-rich-quick schemes.

Bad for business

Experts are concerned that the flood of junk mail could drive away users — especially consumers — which would be bad for businesses that want to use the Internet and online servicea marketing tools for consumer products and services. That's especially a concern when children have access to E-mail, said Jeffrey Zonenshine, vice president of information technology at Century 21 Real Estate Corp. in Parsippany, N.J.

"I could see families being more restrictive and less interested in pursuing a kind of vehicle that could put them at that sort of risk," Zonenshine said. That would be bad for business at Century 21, which recently launched a forum on AOL.

Blocking E-mail from offensive domains is nothing new. This option has been available to Internet service providers and online services for years, and many take advantage of it. The tactic is so common, it even has a nickname — the "Internet Death Penalty."

For instance, The World, a Brookline, Mass., Internet service provider, blocks E-mail from eight domains. So far, no customers have asked to get the access restored, said Barry Shein, president of Software Tool & Die, which owns and operates The World.

But others have rejected blocking all E-mail from a domain as an unconscionable act of censorship.

"I'm extremely sympathetic to what AOL is doing, but [I'm] unwilling to do content control," said Glee Cady, manager of public policy at Netcom On-Line Communication Services, Inc. in San Jose, Calif.

Switch options multiply

CONTINUED FROM PAGE 1

ucts are largely proprietary and likely to primarily attract the installed base, the average user is expected to gain from the market pressure that is forcing vendors to put more features into their systems for less.

"With huge increases in traffic brought on by the Internet and the specter of that worsening with the proliferation of intranets, we need to [upgrade] our network foundations — and that's done via switching," said Bill Horst, chief at the General Services Administration's communications branch in Philadelphia.

Product announcements

Specifically, the vendors will roll out the following:

- **Cabletron's MMAC-Plus Access**, which offers all the LAN switching capabilities of its flagship switch at roughly a third of that switch's cost of approximately $20,000.
- **Cisco's data center switch**, called the Catalyst 5500, which analysts said will give Cabletron's MMAC-Plus a run for its money.
- **Cisco's Tag Switching**, an end-to-end switching scheme that analysts said is more versatile and feature-rich than Ipsilon's hot IP Switching technology.

"Cisco definitely needs to have a high-end data center switch to extend their product line," said Mike Ruhrdanz, director of engineering at the University of Nebraska in Lincoln.

He said that means he can settle on one vendor for all his switching needs rather than go with several providers and attempt to forge interoperability among proprietary products.

"I really like [Cisco's plans to enhance StrataCom's BPX WAN switch] to extend Tag Switching over the wide area. This is the result I wanted to see from the Cisco/StrataCom merger."

— Bill Horst, General Services Administration

Analysts briefed by Cisco said they expect the San Jose, Calif., company to detail plans to enter the high-end data center switching market via the Catalyst 5500.

That switch will have twice the capacity, almost three times as many slots and far higher port density than Cisco's flagship switch, the popular Catalyst 5000. No pricing information was available on the 5500.

On the opposite end of the market spectrum, Cabletron will take on Cisco with its first affordable and versatile low-end switch.

The MMAC-Plus Access offers more switching options and port density than the Catalyst 5000. Still, analysts said all the extras — such as Token Ring and Fiber Distributed Data Interface (FDDI) — may be overkill for a low-end switch.

More affordable

Users and analysts have long been critical of Cabletron's MMAC-Plus because of its high cost. "We looked hard at the MMAC-Plus but just couldn't afford it," Ruhrdanz said.

But the new Access costs less than $7,000. A comparably equipped Access costs about the same as a Catalyst 5000 but offers Token Ring, FDDI and Asynchronous Transfer Mode switching.

Separately, Cisco is taking a shot at IP Switching, a technology developed by Ipsilon [CW, Sept. 2] as a backbone booster that speeds TCP/IP exchanges through networks, intranets or the Internet.

Cisco will counter with a scheme called Tag Switching, which differs from IP Switching in that it supports other protocols and lets routers talk to other routers when relaying traffic flows. IP Switching lets only routers talk to switches, sources explained.

Web users gain view of management data

CONTINUED FROM PAGE 1

Previously, managers had to go to one of a few complex and powerful consoles to check Management Information Base (MIB) data from their systems, applications and internetworking gear, which report via SNMP.

They have a jump on vendors allied in the World Wide Web-based Enterprise Management (WBEM) effort. Those vendors promise to define an interface for such a Web capability sometime next year [CW, July 22].

New outlook

"It's clear now that we must revise our view of the network management platform because the Web is taking over as the point for integrating diverse management information," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

These introductions will speed the shift to direct delivery of management data to multiple platforms, said Wayne Morris, director of corporate strategy at Houston-based BMC Software, Inc., which backs the WBEM effort. "The WBEM interface will enable Web access to the SNMP world eventually, but we could take advantage of these tools right away," Morris said.

Some internetworking vendors are starting to embed Web server functions in routers, switches and hubs so managers can check or configure them remotely. But that step leaves many devices behind.

"Web access to raw statistics is nice but users demand interpretation. They want to know how the oranges taste, not how many are on the tree
Lou Steinberg
president, NetOps

The upcoming translation software could help integrate older installed equipment into the new Web-based management applications, said Lou Steinberg, president of NetOps Corp., a network management consultancy in New Fairfield, Conn.

Epilogue will introduce encoding/decoding software called Decorum. The software will let OEMs provide access to standard SNMP-enabled devices through any browser, according to officials at the Sunnyvale, Calif., company.

SNMP Research in Knoxville, Tenn., will introduce the DR-Web Extensible Agent, company officials said. This software loads in any SNMP-enabled device or system, then enables interaction with MIB data from a Web browser.

In-house developers can build tools with this agent software. It should ship in November for $1,995, plus $45 per device.

Some users, however, said they don't want to deal with the raw statistics fetched from MIBs. They prefer to let vendors interpret and present the data before they see it through a browser or a traditional console.

"Web access to raw statistics is nice, but users demand interpretation. They want to know how the oranges taste, not how many are on the tree," Steinberg said.

OneTouch may simplify net diagnoses

Fluke to offer handheld testing tool

By Patrick Dryden

Fluke Corp. next week plans to introduce a handheld network test device that gives field technicians a simple tool to find problems quickly and reduce downtime for users.

The OneTouch Network Assistant does a series of automated tests for packets and wiring through an icon-based interface on a touch screen.

OneTouch Network Assistant *automatically tests packets and wiring via an icon-based interface*

This helps troubleshooters in the field diagnose connections and systems on their own, minimizing calls to experts in the central operations center.

"It sounds very helpful," said Brian Burba, a network management analyst at International Data Corp. in Framingham, Mass. "There's a raging need for simpler management tools as networks grow more pervasive and draw more users into the support process."

An extra hand

Such a tool could help Arizona Public Service Co. (APS) find and fix problems throughout its statewide network, said Mons Ellingson, leader of the network management engineering group at the electric utility in Phoenix.

"Our contract technicians don't have a lot of network experience, so they really need this help," Ellingson said. Fluke's new tool "could save time [spent] tracking the cable when the problem really lies with a server or hub."

Like many information technology groups, the central management staff at APS must cope with limited size, time and travel flexibility.

"Making tests simple for field technicians would help us so [that] we don't have to send one of our top engineers," Ellingson said.

OneTouch Network Assistant combines the most popular functions of cable testers and protocol analyzers.

It checks Ethernet connectivity between stations and servers, across segments and through hubs and routers.

A flashing icon indicates a problem source. Touching that icon displays details such as the address of a faulty component or a cable map. This allows the technician to quickly find and service a bad connector or wire flaw.

Network health statistics identify the busiest stations and top protocols in use. Tests provide details on specific stations, hubs, routers and servers. For example, a user can check the response time and other information about servers running NetBIOS, Microsoft Corp.'s Windows NT and Novell, Inc.'s NetWare.

The device also interprets statistics. It advises when collision or utilization rates are acceptable, for example, and when they should be reported to network experts for further evaluation.

OneTouch Network Assistant will be available this month for $3,695. A model priced at $4,995 will check both 10M and 100M bit/sec. Ethernet — the first handheld tester for Fast Ethernet, the Everett, Wash., company said.

That is too pricey for APS to outfit every technician, according to Ellingson. "We could check out testers or ship them to remote sites, then help with troubleshooting over the phone," he said.

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The Information Management Company

Schools give notebooks the old college try

Campuses are instructed to replace desktops

By Mindy Blodgett

For years, "back to school" at many college campuses meant buying desktop PCs for hordes of incoming students. Now some administrators are finding it better to give students notebook PCs to add to their stack of notebooks.

This fall, all 1,000 students and 55 faculty members at Valley City State University in North Dakota went mobile with a campus-wide deployment of IBM PC Co. ThinkPad notebooks.

Valley City State followed the lead of the University of Minnesota, Crookston, which in the fall of 1993 became the first university to implement notebook use by its 1,000 students and 60 faculty members.

Acadia University in Wolfville, Nova Scotia and Wake Forest University in Winston-Salem, N.C., also are arming their first-year students with laptops.

The college deployments are part of a fledgling trend in higher education away from desktop PCs and toward portable computing, industry observers said.

"Why put money into hard-wired laboratories when students can bring portable computers into the classroom and plug their notebooks into the network for in-class use?" asked Jane Ryland, president of CAUSE, a Boulder, Colo.-based association for campus information systems managers.

Valley City State's Ellen Chaffee: *'Notebooks can do just about anything desktops can do'*

This trend is occurring in the corporate market. Giga Information Group in Cambridge, Mass., this year predicted that by 2000, one in three workers will use laptops — up from one in five today. And of those portable users, 80% will use notebooks as the primary PC — up from 30% today (CW, April 8).

"With portability, the student or teacher can use the machine anywhere," explained Ellen Chaffee, president of Valley City State. "And notebooks can do just about anything desktops can do."

To pay for the laptops, Valley City State charges its students a technology fee of $475 per semester. A $1.7 million federal grant helped to equip 12 classrooms with multimedia capabilities, including Ethernet power connections and big-screen TVs.

The notebooks have Windows 95, word processing, spreadsheet, database, electronic-mail and Internet capabilities. The university also set up a help desk staffed by students.

Lessons learned

Bruce Brorson, senior technology associate at the University of Minnesota, Crookston, said his institution has learned the following lessons in the past three years:

- Spend time training students and teachers on the technology before the semester starts.
- Try to standardize on one notebook. "Some faculty stayed on desktops the first year, which wasn't very helpful," Brorson said.
- Hire help desk workers with "good human skills" and technical skills. "Many callers just want to vent," Brorson said.

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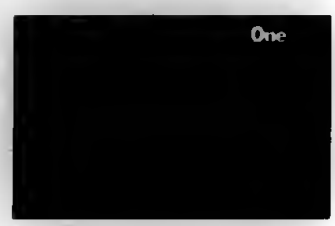

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Netscape opens Web app site

By Kim S. Nash

Netscape Communications Corp. is putting the pedal to the metal in the emerging turnkey Web package market.

The company today will unveil AppFoundry, a World Wide Web site that features free productivity, work sharing and other applications built in Java and HyperText Markup Language (HTML) specifically for Netscape's servers and browsers.

AppFoundry is intended to kick-start intranet and Web development. For example, information systems managers who want to sell the intranet to executives can download the applications for a taste of the Web.

Or, because all source code comes with the software, IS can customize the packages for quirky, in-house systems.

Lassoing third-party support is a must for Netscape, which faces an army of long-time Microsoft Corp. developers converting applications to or building new systems for Microsoft's ActiveX technology.

AppFoundry is a good start, but "it's flimsy," said Mike Kennedy, an analyst at Meta Group, Inc. in Burlingame, Calif.

The packages aren't core business applications, such as accounts receivable or inventory control.

Instead, AppFoundry offers smaller programs, such as a corporate events calendaring package and a meeting room manager, that are meant to complement mainstream financial and human resources systems, said Kevin Tsurutome, a product manager at Netscape in Mountain View, Calif.

Netscape is talking to client/server vendors such as Lawson Software and PeopleSoft, Inc. about integrating their heavy-duty business applications with Netscape Web servers and browsers, but no deals have been signed, a Netscape spokeswoman said.

Meanwhile, Microsoft has allied with client/server powerhouse SAP AG. "Netscape has their work cut out for them," Kennedy said.

Users can download AppFoundry's initial 21 packages one-by-one or wait until early next year for the next release of Netscape's Enterprise Server, which will come with the programs on a CD-ROM (see chart). Netscape plans to include 100 applications in AppFoundry by year's end.

Netscape also plans to offer some applications, though "this is not about Netscape. This is to promote our partners," Tsurutome said.

AppFoundry applications must be written in HTML or Sun Microsystems, Inc.'s Java or JavaScript. For example, Internet Media Services in Palo Alto, Calif., rewrote its Toc time tracking package in Java; the package was originally written in C.

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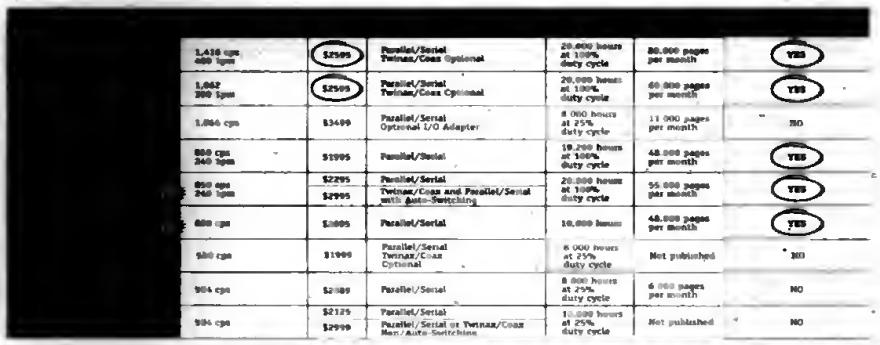

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Netscape opens Web app site

By Kim S. Nash

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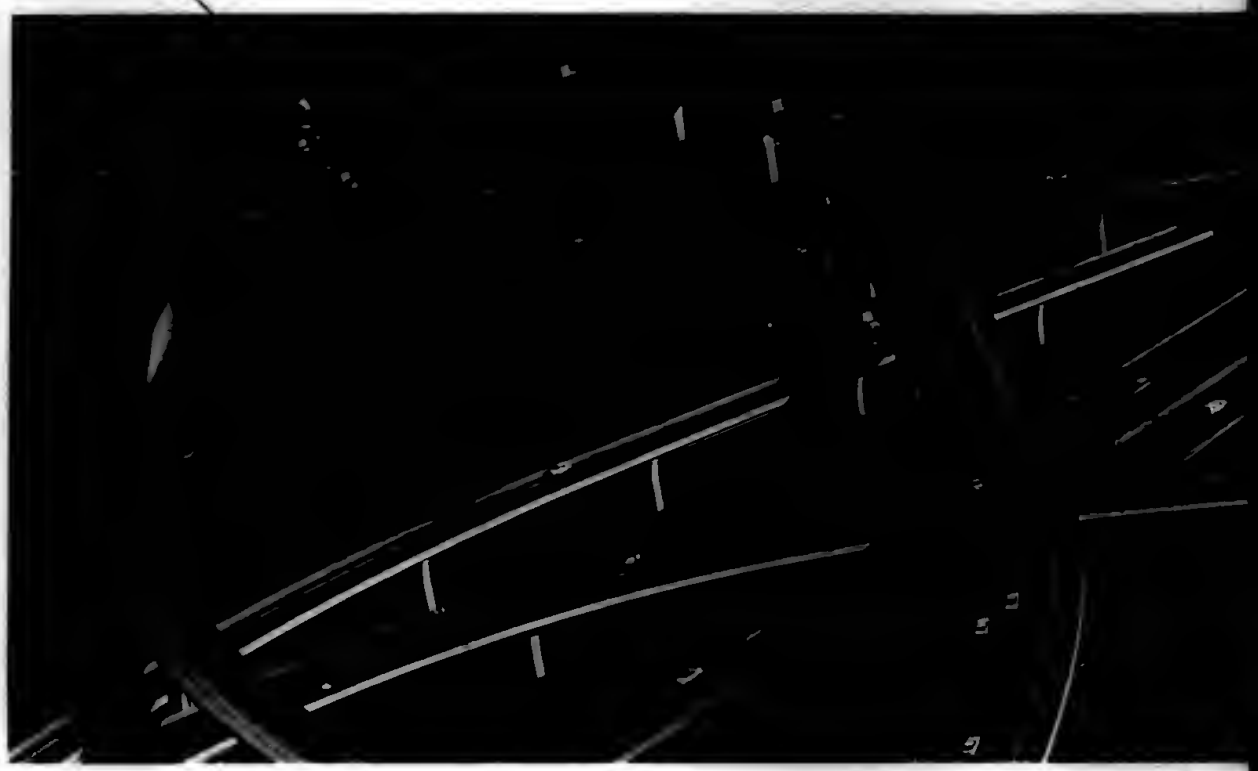

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Has It Changed Your Life Yet?

Users to get E-mail cookbook

By Tim Ouellette

Instead of just showing off new electronic-mail products, a major industry group is trying to show how these products work together.

The Electronic Messaging Association (EMA) will host the EMA Solutions Summit later this month in Santa Clara, Calif., to tackle interoperability issues among major off-the-shelf E-mail packages.

At the summit, "We'll show [users] how to make the different products work when you buy the box of software, and they will get an actual blueprint [on CD-ROM] of how to go about doing it," said Victor Parra, president of EMA (www.ema.org).

EMA wants to tackle E-mail interoperability at the most basic level first. It will show users how different packages can work together without the huge consulting and outsourcing costs of more complex systems.

"Though technically many of these products do work together out of the box," users still face some difficulty in that there is no clear explanation of how to make this happen once the software is purchased, Parra said.

And analysts estimate that most companies run at least two or three E-mail systems, on average. As a result, users may waste time and money by outsourcing relatively minor work to consultants or integrators.

For example, many products can trade E-mail messages via Microsoft Corp.'s Messaging Application Programming Interface transport. But messages can still lose attachments, headers and some graphic content if users don't tailor the installation properly for the two different products.

Participating vendors in the summit include the leading E-mail makers: Lotus Development Corp. (Notes and CC:Mail), Microsoft Corp. (Mail and Exchange), Novell, Inc. (GroupWise) and Hewlett-Packard Co. (OpenMail).

Additionally, Netscape Communications Corp., Intel Corp., MCI Communications Corp. and AT&T Corp. will participate to test E-mail interoperability with Internet products.

The Arlington, Va., group of user and vendor companies plans to use the event to launch EMA Test Labs, a testing service that will address various E-mail and communications interoperability issues.

The next scheduled test will focus on a more complex subject, the X.500 Internet directory interoperability standard (see story below), scheduled for EMA's conference next April in Philadelphia.

Suite success

Bundling deals strengthen Corel Office suite in retail channel

By Lisa Picarille

It has been just a little over six months since Corel Corp. acquired Novell, Inc.'s Applications Business Division. But already the Ottawa company is making some headway in the suites market.

Microsoft Corp.'s Office product remains the dominant suite, with 76.5% of the market, according to Dataquest, a research firm in San Jose, Calif. Corel has just 3.4%.

But Corel's aggressive campaign to forge bundling deals with hardware and software developers has sparked a surge in Corel Office sales at the retail level, which includes computer outlets, superstores and electronics stores. Corporate users typically establish an account with a software distributor rather than go to a mall to make a purchase.

In retail sales, Corel Office has 51% of the office suites market, ahead of Microsoft's 45%, according to recent figures from PC Data, a market research firm that specializes in the retail channel. Lotus Development Corp.'s SmartSuite has 4% of retail suites sales.

"Corel has been pretty aggressive at retail and accomplished what they set out to do," said Jeff Silverstein, editor of "Software Industry Bulletin," an industry newsletter in Stamford, Conn. "But it's unclear whether that will translate into an increase in overall market share." Silverstein attributed some of the spike in Corel's sales to the recent debut of a new version of WordPerfect Suite. "Plenty of WordPerfect customers held off upgrading to see who was going to buy the products," he said.

Trying to gain even more ground, Corel has announced a deal to bundle Netscape Communications Corp.'s Navigator browser with its Corel Office suite of productivity applications. The move is just one in a series aimed at combating rival Microsoft Office, which ships with Microsoft's Internet Explorer browser.

Also, Corel has announced a deal with Compaq Computer Corp. to bundle CorelDraw 5 with Compaq's Presario line of consumer PCs.

Bundle buddy

Microsoft, having noticed Corel's aggressive OEM moves, has started forging its own bundling agreements. It announced that it will bundle the Macintosh version of Office on some Apple Computer, Inc. Power Macintosh models in Europe. That is Microsoft's first Office bundling deal with Apple, although the Redmond, Wash., software giant has an agreement with Macintosh clone maker Power Computing Corp. to bundle Office for the Macintosh on high-end machines. To prevent further erosion of its dominant share, Microsoft will add WordArt, a drawing package, to Office 97, which is due by year's end.

Sources close to Microsoft said company officials were worried that Microsoft Office was losing sales to Corel Office because Corel's suite included its best-selling CorelDraw drawing package.

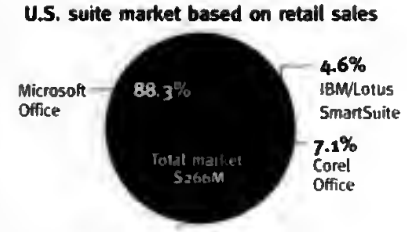
Sharing the suites

Revenue for the application suite market worldwide increased by 58%, from $1.9 billion in 1994 to $3 billion in 1995

Q1 1996 worldwide suite market

Source: Dataquest, San Jose, Calif.

U.S. suite market based on retail sales



Source: PC Data, Reston, Va.

X.500 is the right ingredient

Although the X.500 standard for integrating different directories has been around for a while, users are still struggling to find decent products that implement it effectively.

The standard allows directory servers to share data on more than just E-mail addresses. Basically anything a company wants to track, including network resources, mail stops, phone numbers and job titles, can be a field in an X.500 directory.

X.500 deployment has been hindered because it is complex, primarily targets firms with large, widespread user populations and requires a lot of work to populate the directories with data.

Some observers said they think vendor support for the Lightweight Directory Access Protocol (LDAP) will improve the chances for X.500 support.

But LDAP goes only so far by providing client access to X.500 directories while full X.500 offers server-to-server compatibility.

The bottom line, according to Susan May, a consultant at KPMG Peat Marwick in Washington, is that despite these difficulties, vendors and users know this is the route for them. She has worked on X.500 projects for government and commercial sites during the past two years without a break because there is so much user demand. — *Tim Ouellette*

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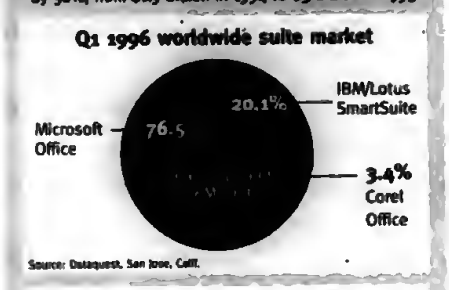

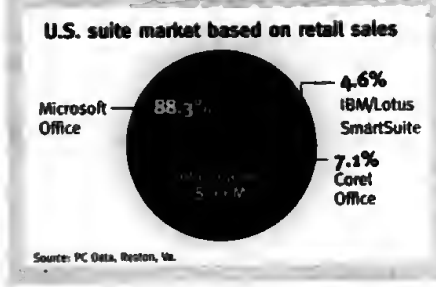

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Born leader.

Sometimes "One size fits all" just doesn't feel right.

(That's also true for data networks.)

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How will you use it?

Computer Industry

Cisco buy gooses Gigabit Ethernet

By Bob Wallace

The mad dash to develop Gigabit Ethernet products could mean users will have enough backbone network capacity to handle the deployment of switched and Fast Ethernet to workgroups possibly by year's end.

Cisco Systems, Inc. last week became the latest — and one of the largest — internetworking vendors to commit to the emerging technology. It did so by announcing plans to acquire Gigabit Ethernet pioneer Granite Networks, Inc. for $220 million.

Gigabit Ethernet enables the original 10M bit/sec. Ethernet technology to run at 1G bit/sec. by tweaking its components to accommodate far higher speeds. Cabletron Systems, Inc. and a slew of start-ups have pledged Gigabit Ethernet products, some by the end of the year.

Good for the backbone

From an engineering standpoint, Gigabit Ethernet would make sense in backbone networks. That's because users run switched 10M bit/sec. to desktops and 100M bit/sec. Fast Ethernet to servers and between switches. So they need something faster than Fast Ethernet for their backbone networks, where traffic flows are the heaviest.

Gigabit Ethernet will allow businesses to deliver bandwidth-demanding graphics-based applications, imaging and video-conferencing to employees. All are especially attractive to manufacturing, health care and insurance firms.

That means no painful upgrades, no retraining of information systems staff and no preproduction technology pilots, all of which drain IS resources and budgets. But users who need the ability to support multiple types of traffic will need Asynchronous Transfer Mode.

Users can expect to see the first fruits of Gigabit Ethernet development efforts at Networld/Interop '96 in Atlanta next week. Cabletron and many lesser-known firms will showcase prototype wares there (see chart).

Analysts said that, at first glance, it appears Cisco overpaid for Granite, which has yet to ship a product. Yet they agreed the acquisition is a sound investment.

"What they're paying for is the ASICs, which are extremely difficult, time-consuming and cost a ton of money to develop," explained Eric Hindin, an analyst at The Yankee Group in Boston. ASICs, or application specific integrated circuits, are the brains of switches. "Cisco will be able to easily and quickly take the Granite ASICs and implement them in their switches and other products. So what they bought was time-to-market."

Hindin said if ASICs were easy to develop, Fast Ethernet products would have hit the market much sooner than they did and would probably cost far less.

Analysts calm as DEC trips again

By Jaikumar Vijayan

Digital Equipment Corp.'s latest warning of a weaker-than-expected quarter raises questions about the company's turnaround But analysts remain cautiously optimistic.

In an ominous replay of the previous quarter, company officials said last week that slow orders caused by a recent sales force revamp and a continued weakness in European sales were likely to result in lower profits this quarter.

Digital had strung together six profitable quarters, but it posted a $433 million loss in the fiscal fourth quarter ended June 30. Contributing to the loss was a $492 million restructuring charge.

The latest warnings from Digital could be indicative of continuing internal problems, analysts said. But it could just as well be part of a larger, industrywide slowdown.

"We are going to find out that there are numerous companies that are going to be announcing mildly weaker-than-expected earnings this quarter," said Michael Geran, an analyst at a division of Donaldson Lufkin & Jenrette Securities Corp. in Jersey City, N.J.

Contributing to the slowdown are overall pricing pressures and a general weakening of the European market, Geran said. In Digital's case, recent product transitions and internal reorganizations may have contributed, he added.

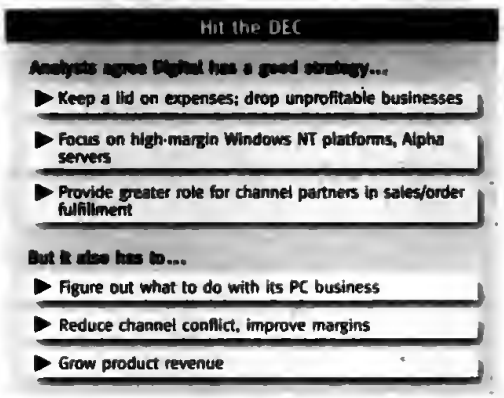
Wall Street's muted reaction to Digital's announcement — Digital stock was largely unaffected — is likely to keep the heat off CEO Robert Palmer, the person analysts believe will inevitably take the rap if the company fails to become profitable again soon.

In four and a half years at the helm, Palmer has been widely credited with turning around Digital's sagging business.

But most of that was achieved through cost-cutting measures that include massive layoffs, the shuttering of numerous facilities and an exit from nonprofitable businesses. Recent initiatives have included attempts to mend relationships with channel distributors and a heavy emphasis on high-margin Windows NT platforms.

Analysts said although Palmer may have succeeded in putting a lid on costs, he has failed to grow product revenue significantly over the past few years. Without that happening, Digital's ability to sustain its turnaround attempts will be seriously hampered, analysts said.

"There is nothing wrong with Digital's business strategy. It has been the execution that hasn't been up to snuff," said David Wu, an analyst at The Chicago Corp. in New York.


Hit the DEC
Analysts agree Digital has a good strategy...
Keep a lid on expenses; drop unprofitable businesses
Focus on high-margin Windows NT platforms, Alpha servers
Provide greater role for channel partners in sales/order fulfillment
But it also has to...
Figure out what to do with its PC business
Reduce channel conflict, improve margins
Grow product revenue

Acquisition brings 'net-based trading nearer

By Thomas Hoffman

Wit Capital Corp., an online stock trading service being launched by microbrewer and "infopreneur" Andrew Klein, has acquired an electronic-commerce software package that will enable it to match stock orders between buyers and sellers when the Internet-based service goes live early next year.

The New York-based firm last week purchased Global Trade, Inc.'s Electronic Price Improvement Center software for "several million dollars" worth of Wit Capital stock, said Chris Keith, president of Global Trade in New York. He also will serve as Wit Capital's chief information officer.

Under the terms of the deal, Wit Capital also acquired the services of Global Trade's 10-person development team.

Internet stock sales

Brewer online

Wit Capital was founded earlier this year by Klein, chairman of Spring Street Brewery Co. in New York The microbrewery's stock last year became the first Internet-based initial public offering.

Wit Capital is expected to be the first Internet-based service to allow individual buyers and sellers of New York Stock Exchange and Nasdaq Stock Exchange issues to match their orders electronically. Electronic order-matching services currently are available only to large institutional investors through private trading services such as Reuter's Instinet and Posit.

Under Wit Capital's model, once buyers and sellers have matched their orders online, Wit Capital (www.witcap.com) will send the orders electronically to an established exchange, where the orders will be executed, Keith said.

Although Wit Capital's service would be unique, industry experts are skeptical about an unproven electronic commerce system launched by a microbrewery with scant stock-matching experience.

"One of the things an Instinet does is check the financial capacity of the players who are buying and selling stocks," said Larry Tabb, an analyst at The Tower Group, a financial services and technology consultancy in Wellesley, Mass.

Those verifications "might be difficult to achieve over an Internet-based [matching] system," Tabb added.

Choosing the best hardware to run Windows NT® 4.0 has forced IS managers to confront their biggest fears:

Failure.

Monkey on your back #1. *Let's face it, migrating to another operating system does involve risk. And now that Windows NT® 4.0 lets your users access mission-critical information right from their desktops and laptops, how do you ensure data availability? By far the most reliable way is through clustering – a technology one company was the first to develop for Windows NT to ensure automatic failover and maximum availability. For you, clustering for Windows NT means uninterrupted access, reduced risk, greater peace of mind—oh, and one less monkey on your back. Read on...*

Finances.

Monkey on your back #2. *Budgets. What about the budgets? How will your current apps work with your new operating system? Will the upgrade work across your existing hardware, operating systems and applications? Or should you bang on your CFO's door again? One company with over 35 years of multivendor integration experience, including global service and support, can do more than just port your apps to Windows NT® It's a company that can give you complete Windows NT interoperability. Which means your information will flow seamlessly across platforms, and your legacy investment will be well protected. So much for monkey #2. Now on to #3...*

Future.

Monkey on your back #3. *Migrating to Windows NT® 4.0 is one thing. But committing to Windows NT long-term, relying on it to play a critical role in your enterprise, that's another. Fortunately, one company—the one we've been talking about—can help. Digital. With our heritage in VAX, multivendor integration, enterprise-level computing, Ethernet and the foundations of networking, Digital is uniquely suited to greatly improve your future. Our newest servers, workstations, desktops and notebooks are every bit as enterprise-ready as Windows NT. In fact, today no other vendor can equal Digital's full line of Windows NT-optimized products across Intel and Alpha platforms, or the service and support that can help keep the monkeys off your back. Simply put, no one is better prepared to show you that migrating to Windows NT doesn't have to drive you bananas. Call 1-800-DIGITAL and press 3 for your nearest reseller, or visit our Web site at www.windows.digital.com.*

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Press C for consult

"Welcome to the Acme Computer Consulting automated support line, providing technical support for users of our consulting services.

"If you are having difficulty starting your consultant, or if you cannot find your consultant, press one. If you already are a customer and are dissatisfied with your consulting service, press two.

<Beep>

"We're sorry our consulting services have not met your expectations. Please respond to the following choices. If your consultant appears to be incompetent, press one. If your consultant is competent but lacks initiative, press two. If your consultant is not showing up for work, press three. If your consultant is sick or dead, press four.

<Beep>

"We're sorry your consultant is incompetent. To receive by fax a list of common solutions for incompetent consultants, press 99. Otherwise, please respond to the following choices.

"If your consultant doesn't understand your business problem, press one. If your consultant understands the problem but doesn't know what to do about it, press two. If your consultant has an answer to your problem, but it's the wrong answer, press three. If your consultant insists on solving the problem with an object-oriented language or CASE tool, press four. If your consultant is totally clueless, press five.

<Beep>

"We're sorry your consultant is clueless. Please tell us what you would like to do. If you want us to fire your consultant, press one. If you want to keep the consultant but want a refund of all or part of your contract fees, press two. If you want to return your consultant to us for refurbishment, press three. If you feel that you may do physical harm to your consultant, please stay on the line.

<Beep>

"You have asked for a consultant refurbishment. Our pickup hours are 8 a.m. to noon, Mondays through Wednesdays. Please leave your consultant in your front lobby or outside the rear of the building, but away from the trash bin. Refurbished consultants are covered by warranty for 90 days.

"We apologize for your consultant's performance and pledge to rectify this situation. Thank you for using Acme, the friendly computer consultancy."

Paul Gillin, *editor*
Internet: *paul_gillin@cw.com*
www.ultranet.com/~pgillin

Cut the hype about software prowess

I read with interest Paul Gillin's Aug. 5 editorial about the Share user group meeting and dealing with industry hyperbole.

He wrecked a perfectly good article with the last paragraph: "Client/server, the Internet and other technologies may eventually shift a few paradigms ..."

Consider the following: How much different would the computer industry be right now if all software components were given equal press?

For example, would OS/2 be as popular as NT? Would mainframes be as archaic as they are made out to be because of the hype of current magazine articles? Would X-terminals be better for many applications than a PC?

As with all software, they are just tools to do a job. The software industry continually looks for a silver bullet and should realize now that no such bullet exists.

The people at Share are correct when they eschew technological marvels in lieu of functionality.

I just wish magazines would learn the same lesson and provide unbiased and informative information about technologies that are not viewed as state-of-the-art. After all, with all the advances in battery-powered screwdrivers, the old hand-twist ones do the job just fine. Why should software be viewed as anything different?

Joe Trubisz
Department of Computer Science
State University of New York
at Stony Brook

Location, location, location

I noticed that on page 39 of your July 29 issue, the map accompanying the "Chasing deadbeats online" article shows Los Angeles County, Calif., on the outskirts of the San Francisco Bay area.

First, Chicago was moved to northern Ohio in your June 24 issue, and now L.A. has been misplaced by almost 380 miles. Hmmm ... perhaps proofreading of the maps is in order. Regards to an otherwise fine periodical.

Jeff Ferguson
Minneapolis

Editor's note: We've heard from several of our alert readers on this very topic, with a few of them even applauding the new location for L.A. We promise to keep a closer eye on geography in the future.

Concerned with info, not orientation

The information I am looking for in my profession, and the reason I read *Computerworld* (and other industry magazines), is not enhanced or affected by the sexual orientation of the people who are interviewed, quoted or reported upon.

Specifically, in response to Scott Abel's letter in the Aug. 12 issue: 1) This is not a nasty letter, and 2) you and your computer-related skills or experiences may make extremely relevant subjects. But your sexual behavior is, in most cases, not relevant to how I apply the solutions or information presented, any more than my sexual behavior is.

Jim Rogers
Saline, Mich.

Chew on this one

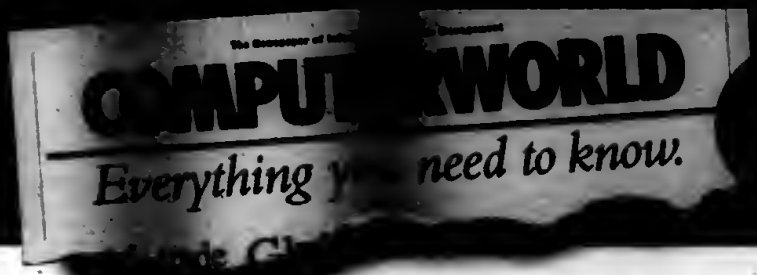
"Inside Lines" is where I turn first when I receive my *Computerworld* issues. There is always some information that is useful, funny or both (and sometimes in the same blurb!).

In the "It's not polite to point ..." blurb [CW, Aug. 12], you wonder what information systems managers do to address problems in multivendor environments. I get everyone into the office and fill them up with coffee, bagels and cream cheese. The tech rep who consumes the most is the one with the story to tell. I can't say that this is a foolproof methodology, but it creates a relaxed environment, shows that we care about people who work on our machines at 6 a.m. (or earlier) and is fun for all involved.

We don't point fingers, and those who do should consider that tech reps carry pointed and sharp objects!

Gregory A. Tutunjian
Brookline, Mass.

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.



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(d) Unix (h) NetWare
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85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./Retailer
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FROM A REPORT BY GREGORY WESTER, AN ANALYST AT THE YANKEE GROUP IN BOSTON:

The evolution of the online newspaper industry will parallel the evolution of a species: Players must fully establish themselves in the next five years or risk extinction. Central to successful evolution will be early and complete buy-in from corporate management. With average start-up costs of $500,000, plus the additional labor expenses for seven to 12 employees, there's going to be a lot of money lost for the next four years. Management must be fully devoted to these efforts throughout the evolution.

While many business models have been attempted, advertising will be the only viable approach — accounting for over 85% of yearly revenues. Subscriptions will account for only 10%, with pay-per-view and other sources accounting for the remainder. [But] even advertising revenues will be slow to mature.

FROM A STATEMENT BY ZONA RESEARCH, INC. IN REDWOOD CITY, CALIF.:

"Info-keiretsu" are global groupings of companies focused on information content, delivery and use. [They] form intense business partnerships based on vested interests.

Zona has identified two highly developed info-keiretsu. The first includes Microsoft Corp., NBC, British Telecom, MCI Communications Corp., News Corp., Dreamworks SKG, Digital Equipment Corp. and CompuServe, Inc. The second info-keiretsu is focused around AT&T, IBM, Walt Disney Co., Time-Warner, Inc., Knight-Ridder, Inc. and Netscape Communications Corp.

In the long term, these info-keiretsu will have a major impact on what information is made available and how that information is presented. What we're seeing are the seeds of a massive coordination and collusion between information creators, deliverers and consumption technology suppliers.

Tyrannosaurus Gates, market predator

David Moschella

Microsoft wants to crush the only thing standing between it and software industry dominance.

During the past 15 years, Microsoft has had it almost too easy as its key rivals have invented new ways to fall on their swords. First, IBM handed over PC operating systems, then Apple did the same with the user interface. At the server level, Novell mysteriously lost its networking focus, while the Unix community repeatedly failed to establish a unified standard, thus opening the enterprise to the one-time industry laughingstock, Windows NT.

Those huge competitive blunders have made it difficult to join the anti-Microsoft antitrust crowd.

But it's now clear that tiny Netscape Communications is all that stands between Microsoft and almost total software industry dominance. Microsoft appears willing to do whatever's necessary to destroy its last real challenger. Consider the following anti-Netscape tactics:

1. Give away products that compete with your rival's core products. Microsoft's give-away of a full range of new products should have triggered protests about predatory pricing. But Netscape's large market lead and the prevailing freeware culture of the Internet have silenced most of the industry. Bill Gates said it all when he told *BusinessWeek*, "We don't need to make any revenue from Internet software." Obviously, Netscape does.

2. Deploy the lawyers. Microsoft on July 30 formally asked Netscape to "cease and desist" promoting its Web server software for use on Microsoft's NT Workstation. Netscape has firmly refused. But some users will think twice before they risk violating Microsoft's NT Workstation license agreement.

3. Apply financial muscle. Microsoft on Aug. 13 announced agreements with seven of the leading World Wide Web sites. In each case, what were formerly per-fee services will be provided free to customers who use Microsoft's Internet Explorer browser. Similar anti-Netscape financial deals have been made with AT&T, America Online and, according to Netscape, many PC manufacturers. In effect, Microsoft now pays customers to use its software.

Netscape has shown no signs of self-destructing, but with Microsoft determined to give away its products and even pay people to use them, the pressure can only increase. Not surprisingly, Netscape has taken legal action, accusing Microsoft of making improper payments in violation of its 1994 federal antitrust settlement. But even a favorable decision might come too late to help.

More tangible help would come from a cash-rich partner with the money to match Microsoft — freeware for freeware, payment for payment. Perhaps IBM, Oracle or Sun Microsystems could get involved. Those three are among 10 companies that just sank $100 million into a Java venture capital fund; it's a step in the right direction.

Why should users care? Five years from now there could be an installed base of 300 million or more browsers. In a competitive market that reflects product costs, browser software would be priced very low, perhaps just a few dollars. If a monopoly leader succeeds in charging $30, that's nearly $10 billion in unnecessary spending, all going into one vendor's pocket. And that doesn't count the server software.

Until now, the Microsoft vs. Netscape battle has been a healthy rivalry. But Microsoft's recent actions have exposed a nature never before displayed so starkly. It's time for the government, the industry or, ideally, both to take action. Microsoft is no longer just a smart competitor; it's a predator at large.

Moschella is senior vice president of research at Computerworld, Inc. in Framingham, Mass. His Internet address is david_moschella@cw.com.

Business alignment: A two-way street

Michael Schrage

Yes, IS should become more business-savvy. But business clients should become more IS-savvy, too.

Between client/server computing, the intranet and rampant decentralization and downsizing, practically every infoguru of note preaches the mantra of aligning IT with business objectives. The IS department needs to become more business-oriented. Who can argue with that?

So IS folks are doing everything from undergoing sensitivity training to becoming executive MBAs to better align themselves with the business units they purport to serve. Admirable? Yes. Futile? You betcha.

There's no question that most people in IS need to become more business-savvy. But there's also no doubt that the overwhelming majority of businesspeople need to become more savvy about being an IS client.

That doesn't mean general managers need to be debriefed on Java vs. ActiveX or the distinctions between intranets and client/server architectures. Technical literacy — or even technical awareness — isn't the point. The reality — which absolutely stuns me — is that not one of a dozen Fortune 1,000 firms I've talked with trains its general managers about how to be a good IS client. Not one!

I'm not talking "expectations management" here. Any project manager with more than an ounce of neurons in their cerebral cortex knows that managing expectations is essential to any successful development and deployment. What I'm talking about is an orientation that gives the internal client some useful tools and rules about making development life better and easier for IS.

Does anyone think it's an accident that Andersen Consulting and Cambridge Technology Partners (CTP) intensely negotiate and orient their clients before taking on an assignment? Indeed, CTP puts its clients through a one-week Rapid Solutions Workshop.

Are technical and business issues discussed and resolved? Sure. But CTP is also training the client on how to be a good CTP client.

How many internal IS organizations can make the same claim? Is it possible that one reason outsourcing has become popular is that clients were unable — or unwilling — to work well with their internal IS shops but were willing to learn from outside firms how best to work cost-effectively on development projects? Everyone talks about the importance of "peopleware" issues, but it's ridiculous to believe that the bulk of the problems inherently come from IS.

Internal IS shops need to steal a page — make that a chapter — from the more successful outsourcers. Look at the internal projects that worked, and develop a set of best practices that can be turned into a one- or two-day workshop to help clients learn how to be better clients. Departments and division teams that assent to such training should get preference from IS. Those that graciously — or rudely — decline should politely be informed that they're hurting their chances for success. Better yet, make them pay extra for the time, money, headaches and heartaches they'll put you through.

Make no mistake: IS has a lot to learn about aligning technology capabilities with business aspirations. But perhaps one of the best ways to attain that alignment is to help train clients on how they can create the best partnerships to create the best software.

Schrage is a research associate at the MIT Media Lab and author of *No More Teams!* His Internet address is schrage@media.mit.edu.

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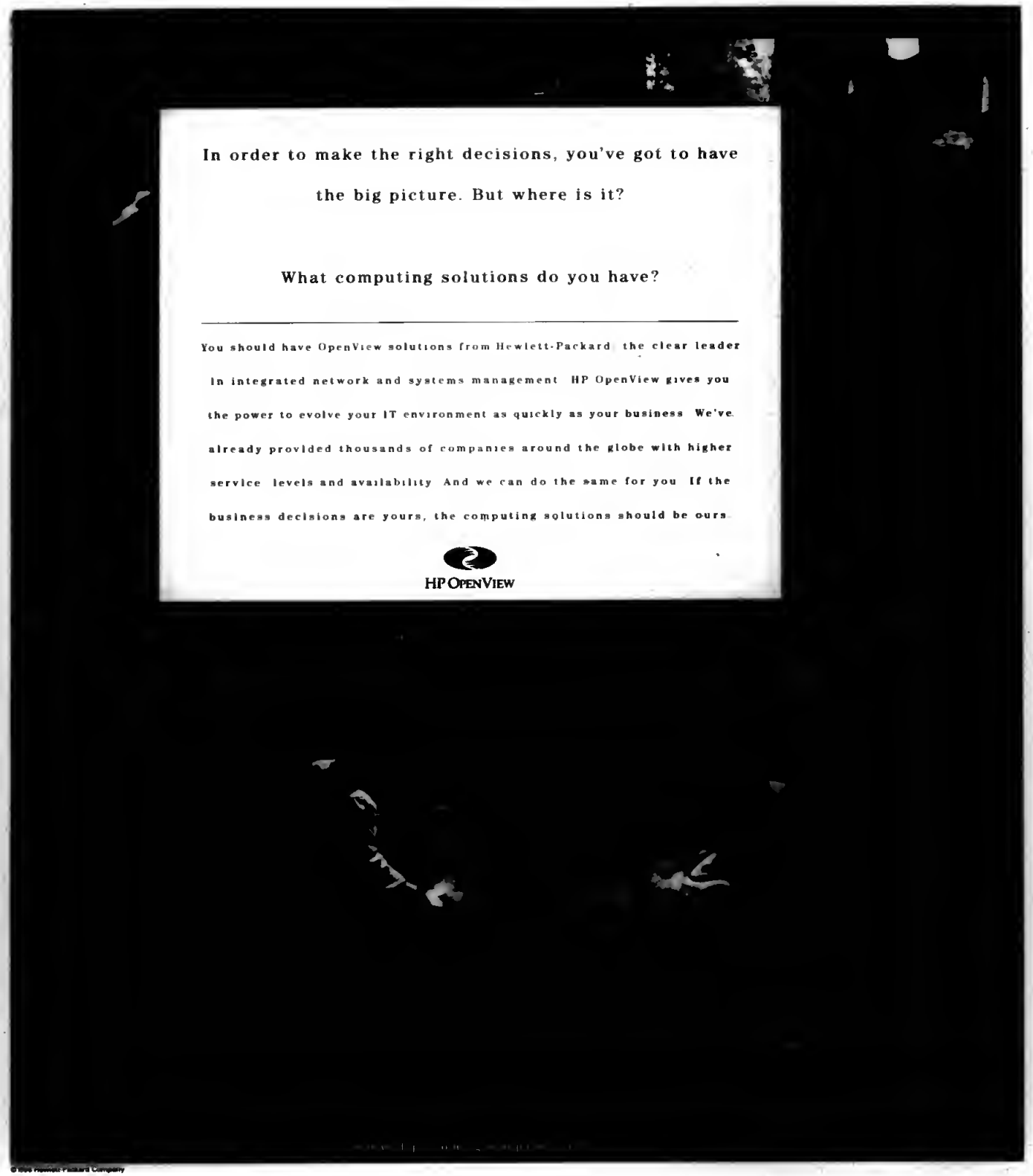
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Amdahl's storage technology crosses platforms, 46

AS/400 users pushed to 'RISC-y' move

By Michael Goldberg

As IBM introduces new capabilities for RISC models of the AS/400, it has begun to slowly fade out features for older models of the machine.

The company last week unwrapped software designed to put RISC models based on 64-bit PowerPC processors on par with older AS/400s that use 48-bit complex instruction set computing (CISC) hardware. Before now, only CISC models supported Lotus Development Corp.'s Notes, for example [CW, Sept. 2].

Having reached this software parity — and promising future advances — IBM officials are encouraging long-time AS/400 users to migrate to RISC machines, which offer more performance for the money. IBM started selling AS/400 RISC models in December.

RISC machines

For users of the older CISC models, the message is clear, users and analysts said: If you will need more computing capabilities in the future, move to RISC. If you run a stable operation that isn't expected to change or grow very much, IBM will support you on CISC — up to a certain point.

IBM, *page 46*

Closing the gap

DG joins in race to provide Windows NT clustering capabilities

By Jaikumar Vijayan

Users won't have to wait for Microsoft Corp.'s mid-1997 delivery schedule to get Windows NT clustering capabilities. Several vendors are already stepping into the breach.

Data General Corp., for instance, recently added its name to the rapidly growing list of vendors that offer fail-over clustering for Windows NT. Other companies include Digital Equipment Corp., NCR Corp. Tandem Computer Corp. and Compaq Computer Corp.

These vendors provide what Microsoft can't: software that lets users "cluster," or tie two Windows NT servers together, with one backing up the other. If the primary server fails, the backup server automatically takes over, which allows users to protect and recover data.

DG's Aviion NT clusters, for instance, let users tie two quad-processor Windows NT servers in a so-called high-availability cluster.

The Aviion NT Cluster combines Firstwatch for NT fail-over from Veritas Software Corp. with DG's Intel Corp.-based Aviion server line. It also includes DG's fault-tolerant Clariion RAID technology storage systems. Prices start at about $50,000.

The reliability and uptime provided by clusters such as these have been available for years in the Unix space and are considered vital by users thinking of using NT for critical application environments, analysts said.

Denman Tire Corp. in Leavittsburg, Ohio, for instance, migrated most of its crucial applications from a proprietary system to a Unix environment about two years ago.

"At that time, Unix was the only environment that offered the scalability and fail-over we were looking for," said Tim Boyer, data processing manager at Denman. But if features such as high-availability had been available in Windows NT two years ago, "we may have decided to go with it instead," he said.

Microsoft is leading a group of hardware vendors, including Digital, NCR and Compaq, in a joint development effort called WolfPack. This effort involves integrating clustering capabilities on Windows NT. But volume shipments of cluster-capable software for NT aren't expected to start until the middle of next year.

"But you've got to have something right now, which is why all these vendors are doing their own announcements," said James Greene, an analyst at Summit Strategies, Inc. in Boston. Greene said vendors with early Windows NT cluster products will most likely integrate their products with WolfPack when it becomes available.

"To that extent, most of these announcements are like placeholders. It allows vendors to gain some credibility and differentiation" by the time products from WolfPack become available, he explained.

DG's Aviion NT Clusters

Up to two quad-processor Pentium Pro servers and up to 4G bytes of memory

$50,000 for entry-level Aviion NT Clusters, including two Aviion servers, a Clariion disk array, Windows NT clustering software and support for one year

Low prices, greater power launch Pentium Pro servers into mainstream

By Bob Francis

The second generation of Pentium Pro-powered PC servers is coming to market at prices likely to lure information systems managers away from standard Pentium systems.

New systems from Dell Computer Corp. in Austin, Texas, Hewlett-Packard Co. in Palo Alto, Calif., and Advanced Logic Research, Inc. in Irvine, Calif., all were designed for lower-end PC server applications.

For users, the new Pentium Pro systems could mean more than just additional power at a lower price. "Basically, once we get the Pentium Pro systems on our approved buy list, it means eventually we'll be dealing with a more common platform for all our PC servers," said Erik Goldoff, IS manager at the Centers for Disease Control and Prevention in Atlanta.

With the new lower-end Pentium Pro systems, IS shops could use Microsoft Corp.'s Windows NT operating system for functions such as print and file servers. Intel Corp.'s Pentium Pro microprocessor was designed for 32-bit operating systems, such as Windows NT, while the standard Pentium processor still uses 16-bit code. That means NT applications will run faster on Pentium Pro processors than on the standard Pentium, said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz.

Prices for entry-level Pentium Pro servers are also dropping. Most Pentium Pro systems started at approximately $5,000 to

Pentium Pro, *page 48*

Amdahl's storage technology crosses platforms, 46

Servers PCs

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What it costs

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PowerEdge, Model 2100

Processor: 180-MHz Pentium Pro
RAM: 32M bytes
Cache: 256M bytes
Disk drive: 2G bytes
Price: $3,799

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Pentium Pro, *page 48*

Migration service with a twist

Amdahl's storage technology crosses platforms, lets users move data while still running apps

By Michael Goldberg

Amdahl Corp. last week introduced a storage technology that lets mainframe users move data to newer disk arrays while continuing to run their business applications.

Amdahl, based in Sunnyvale, Calif., initially plans to release its Transparent Data Migration Service (TDMS) to users migrating data to its Spectris storage subsystems. Spectris systems, which use RAID technology to provide error-recovery and backup capabilities, started shipping in April.

Mainframe storage

Strong point

The strength of Amdahl's implementation is that "you don't have to take an application off-line" to move data, said John McArthur, an analyst at International Data Corp. in Framingham, Mass.

The move within a data center is done as a batch job by the mainframe and may take five seconds to switch data addresses from old storage to new, Amdahl officials said. End users doing data entry might see a slower-than-usual response time from the system for a moment, but the computer system continues to operate.

McArthur said TDMS could give users more flexibility in their data migration efforts because the technology isn't tied to Amdahl storage subsystems. Users potentially could use TDMS software from Amdahl to move data from older storage devices to newer subsystems that are compatible with the IBM System/390, he said.

However, the storage market leaders, IBM and EMC Corp., currently can't offer this capability.

IBM is working to provide this type of technology, according to McArthur. IBM offers two copying technologies that can be used for data migration — Exteoded Remote Copy and Peer-to-Peer Remote Copy. Like Amdahl's offering, Peer-to-Peer Remote Copy allows businesses to keep their applications running, but it also requires users to move data to an IBM disk array.

EMC provides Symmetrix Data Migration Services for the same function and also requires migrated data to move to an EMC Symmetrix. The other market player, Hitachi Data Systems Corp., also has said it will provide data migration technology (see chart).

General availability unknown

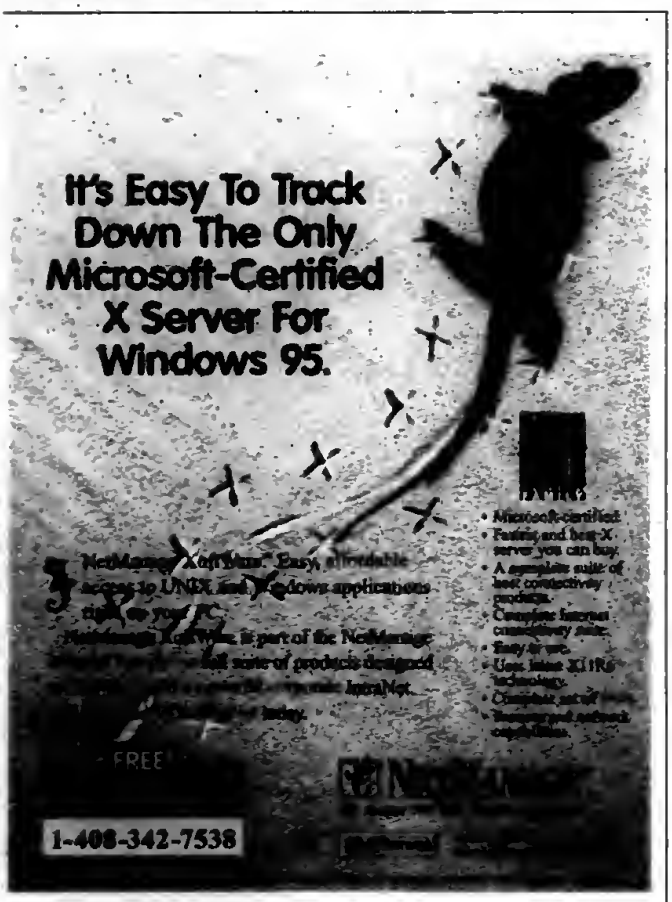
Paul Ellis, a compatible storage marketing manager at Amdahl, said the company will offer TDMS to Spectris users through the rest of the year. He added that if "a large, strategic customer" wanted to use the technology to migrate data to another vendor's storage system, Amdahl would help out. However, the company isn't saying when the technology will be made generally available.

The cost of the TDMS technology includes software and consulting services for the data migration. Prices vary, depending on the size of the job, but a user moving 1T byte of data would have a list price of $139,000.

TDMS requires mainframe users to have Version 4.2 or higher of the MVS operating system.

Taking flight

VENDOR	MIGRATION TECHNOLOGY	STRENGTH
EMC	Symmetrix Data Migration Services	No mainframe CPU
IBM**	Peer-to-Peer Remote Copy Extended Remote Copy	Keeps applications online Can copy data to 'site' 43 kilometers away



AS/400 users pushed to 'RISCy' move

CONTINUED FROM PAGE 45

Glen Van Benschoten, director of systems product management for the AS/400, said IBM will provide new operating system bug fixes for CISC users for the next several years. For example, the latest CISC edition of the OS/400 operating system, Version 3, Release 2, will get bug fixes through 1998 at least, he said. Version 3, Release 2, is probably the last major CISC operating system release, he said.

CISC users won't get some new technologies. Only RISC AS/400 models will be able to run Notes natively, according to Van Benschoten.

Now, both CISC and RISC machines support Notes through a second processor board running OS/2 and located inside the AS/400. Native OS/400 support for Notes would improve performance and requires RISC hardware, IBM officials said.

Other users who may want to stick with older AS/400s will find IBM's response directly proportional to their numbers, said Tom Bittman, an analyst at Gartner Group, Inc. in Stamford, Conn.

"IBM would love to force people to move [to RISC], but they're hedging their bets" by offering some software enhancements to satisfy CISC users, Bittman said. If enough users clamor for more, IBM will be forced to offer more, he added.

Keeping watch

Users said they have closely monitored these developments in choosing whether to migrate to RISC. And last week's announcement of the second OS/400 release for RISC machines, called Version 3, Release 7, provides a greater comfort level.

"We're prepared to move to [RISC] technology now that it's been out for a bit," said David Vella, computer systems administrator at The Canadian Surety Co., an insurer in Toronto. Vella said his company could get similar hardware performance with a RISC model for about $100,000 less.

Free software

IBM is offering a free beta version of its AS/400 client access software for Windows NT workstations via the World Wide Web site (www.ibm.com).

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New Products

Cybernetics, Inc. has introduced a half-height, 3.5-in. 8mm tape drive, the CY-8000.

According to the Yorktown, Va., company, the CY-8000 can store 25G bytes uncompressed on one tape and up to 125G bytes compressed. It provides Fast/Wide SCSI interfacing and a 4M-byte data buffer. It works with most computer systems and is available in a single- or multidrive desktop, rack mount or tape library configuration. It features an Advanced SCSI Processor that allows two or more drives to work together in striping, mirroring, cascade, off-line copy/verify or independent modes.

Pricing depends on configuration.

▶ *Cybernetics*
(804) 833-9000

Dolche Computer Systems has introduced PanelMount, a flat-panel monitor.

According to the Fremont, Calif., company, PanelMount is a plug-and-play 16.1-in. color monitor that is three inches deep. It has 1,280- by 1,024-pixel resolution and 262,000 colors.

PanelMount was designed for rugged environments. It is sealed in steel and has a polycarbonate shield to protect the display. It weighs 20 pounds.

Dolche's PanelMount monitor

Pricing starts at $9,000.

▶ *Dolche Computer Systems*
(510) 661-2220
www.dolche.com

Intergraph Corp. has introduced InterServe 650 and 660, Intel Corp. Pentium Pro processor-based servers for Windows NT.

According to the Huntsville, Ala., company, the servers were designed for data-intensive, mission-critical activities, including online processing, management workflow systems and high-volume Internet traffic. They feature up to four Pentium Pro processors, 4G bytes of memory, 12 Peripheral Component Interconnect and three Industry Standard Architecture slots and 9G-byte drives with a maximum disk capacity of up to 1T byte of storage.

InterServe 650 features two Pentium Pro processors and three 4G-byte drives. Pricing starts at $50,200. InterServe 660 has four processors, three 9G-byte drives. Pricing starts at $64,800.

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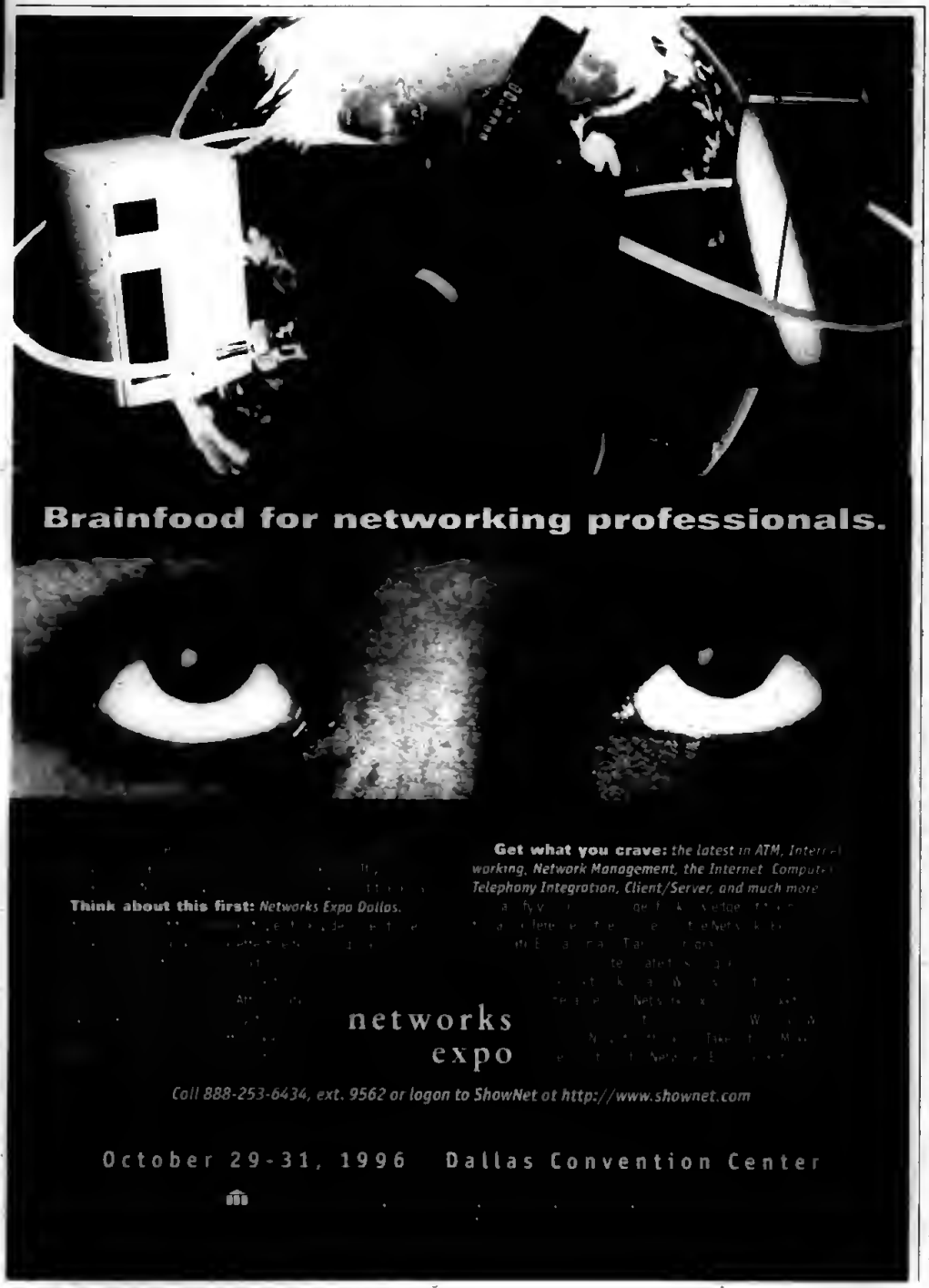
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Pentium Pro

CONTINUED FROM PAGE 45

$6,000, but with the new systems, prices are dropping below $4,000. That may increase the number of companies shifting to Pentium Pro servers, McCarron said.

The price of system memory also has dropped, making the Pentium Pro systems more alluring to IS managers, McCarron said. With additional system memory, the Pentium Pros will show even greater throughput compared with standard Pentium servers. For instance, Dell's new PowerEdge 2100 achieved a price/performance score of $32 per RPMark, according to Client/Server Labs in Atlanta. Previous Pentium-based systems were much slower, company officials said.

Analysts said they expect most of the other server vendors, including Compaq Computer Corp. and IBM, to offer low-end Pentium Pro-based servers later this year.

The usual suspects

The Top 4 PC server vendors have held their places for several quarters now, says market researcher International Data Corp.:

1. Compaq Computer
2. IBM
3. Hewlett-Packard
4. Digital Equipment

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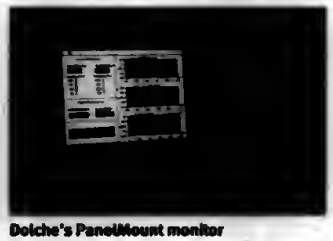

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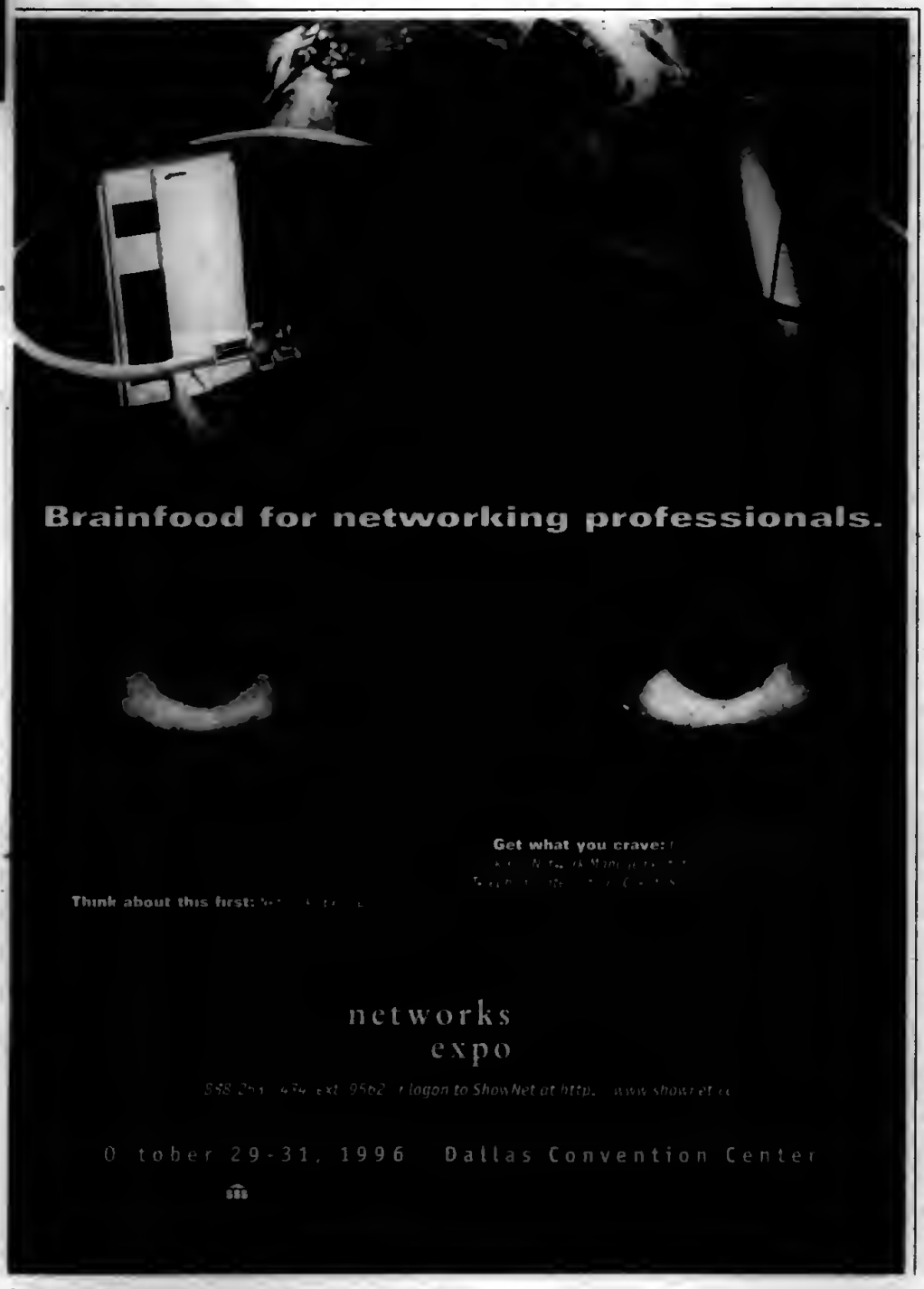

Pentium Pro

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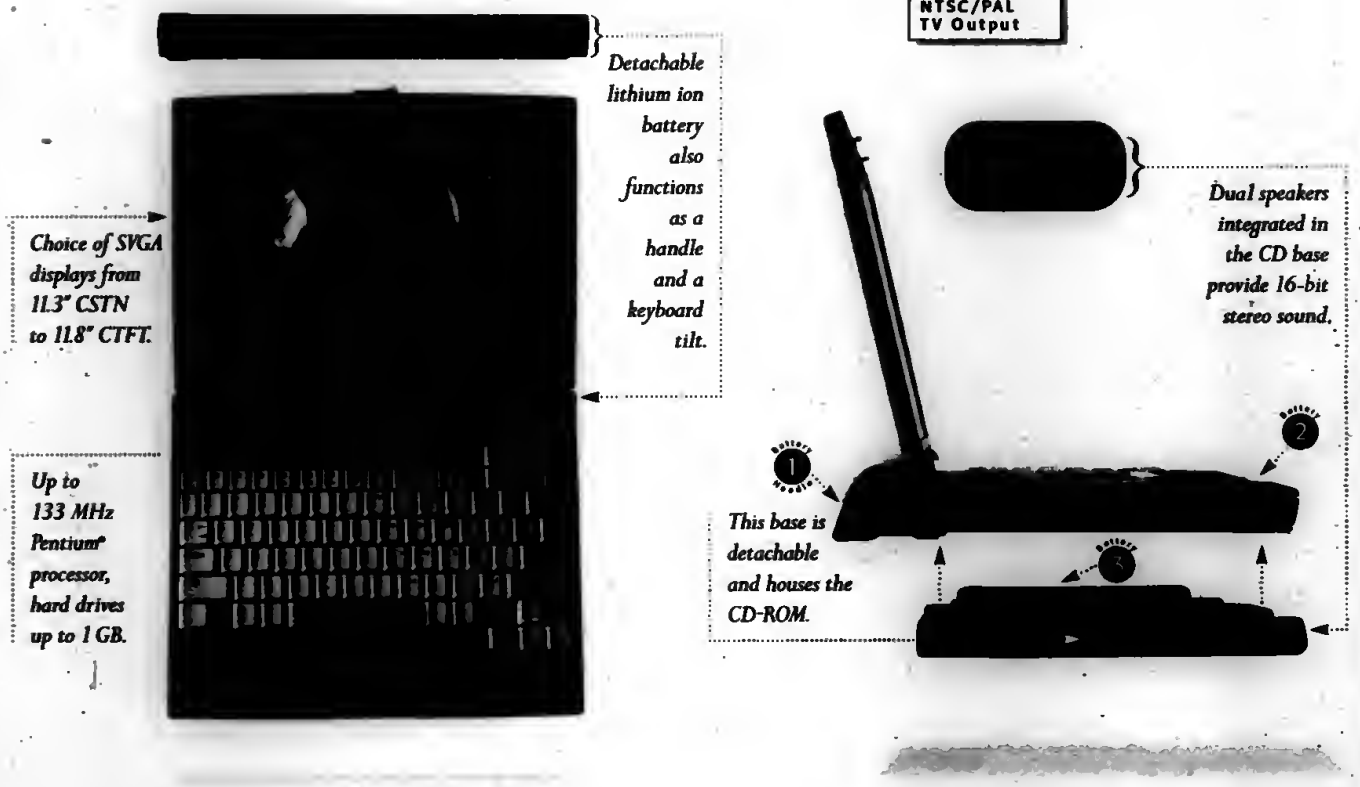
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Software

Experts offer advice on how to avoid downloading hostile components, 54

Exchanging Notes

By Tim Ouellette

Bill Hankard could just see it: loads of money, time and customized programming needed to move data from Point A to Point B.

That's because Hankard, director of application infrastructure at Tessera Enterprise Systems, was dealing with a migration from Lotus Development Corp.'s Notes to Microsoft Corp.'s Exchange.

And the data that employees at the Wakefield, Mass., firm had stored in Notes databases would be trapped, unreachable and unreadable from Exchange's public folders. Those folders are the equivalent of Notes databases, but they store data in messages instead of Notes' file storage format.

"We have a good year's worth of Notes databases we have created and populated," Hankard said. "I honestly did not know how we were going to do this."

But now he has a jump on the job. The Mesa Group, Inc. in Newton, Mass., this week is shipping JumpStart, software that converts and transfers Notes data, hyperlinks, document attachments and objects to Exchange folders and vice versa.

Tessera is moving to Exchange for two reasons: The company is already running Microsoft's Windows NT Server (the only platform for Exchange), and the firm isn't taking full advantage of Notes' myriad groupware capabilities anyway.

Moving to one platform for messaging and basic groupware, which is also already integrated with NT, will save administration headaches for the company, the information systems director said.

But for other companies that choose to run Notes for groupware development and Exchange for messaging, JumpStart can help the products live together for a long time.

> "I think [JumpStart] will do 90% to 95% of the work."
>
> —*Bill Hankard, Tessera Enterprise Systems*

That seems to be the trend. Tom Austin, an analyst at Gartner Group, Inc. in Nashua, N.H., said he expects most companies will see cohabitation of the two products for the next three to five years.

There are about 6 million Notes users. Early estimates released in April put Exchange at more than 2 million users by year's end. But that number may be reduced due to concerns about the ability to scale and manage Exchange (CW, Aug. 12).

Although many vendors have tackled electronic-mail conversion, no one really knew how easily groupware data — such as sales tracking databases — would transfer.

Hankard, therefore, faced lots of customized programming and weeks of chasing down the resulting bugs and errors that would occur with the different data types in Notes. But now, "I think [JumpStart] will do 90% to 95% of the work," Hankard said.

JumpStart does this work automatically, performing bidirectional replication between the Notes and Exchange databases.

In essence, JumpStart does what other E-mail gateway and conversion products have done: It transfers data from one specific format to another specific format.

Trims development time

Much of that is done by providing equivalent Exchange electronic forms for most standard Notes databases. That limits the extra development users would have to perform to move the data themselves.

But customized databases will still require extra work, and no other product besides Notes and Exchange can take part in the conversions.

By the end of the year, Mesa will add the ability to transfer Internet Usenet groups to either product. JumpStart costs $7,500 per Windows NT or Windows 95 server.

SAP throws mix-and-match party

Vendors roll out tools to enhance SAP's new R/3 enterprise system; Business Framework Architecture allows use of separate components

By Julia King

SAP AG's new Business Framework Architecture for R/3 users includes plenty of room for software from third-party vendors.

And not surprisingly — given SAP's vast market presence at more than 8,000 user sites — plenty of vendors are eager to roll out products that work under the R/3 enterprise system's new "componentized" design.

◀ Strategy from the show

SAP's strategy for letting users mix and match third-party software with its R/3 enterprise system centers on BAPIs. SAP is developing the interfaces in conjunction with its customers and partners and will publish them by year's end.

SAP formally announced the new product architecture at the Sapphire '96 users conference two weeks ago in Philadelphia. Under the new design, SAP will sell its R/3 software in the form of dozens of independent software components that users can mix and match with non-SAP software.

The R/3 software is now sold as a single system that features a full range of applications, including order entry, financials, manufacturing and logistics. Splitting it apart will allow users to enhance the system on a part-by-part basis rather than replace an entire R/3 system each time there is a new release.

Under the new architecture's business application programming interfaces (BAPI), users will be able to more easily mix-and-match third-party applications with R/3 without having to build custom connections for each new piece of software.

What follows are highlights of the more than two dozen third-party products announced at the recent users conference. All the products, including SAP's forthcoming R/3 add-on components, will use the new BAPI technology to link to users' core R/3 systems.

- **Lotus Development Corp.** in Cambridge, Mass., demonstrated Version 2.0 of its Lotus Connection for R/3. It lets users access and share R/3 data from a Notes or Lotus SmartSuite desktop. The software is distributed free as an integrated feature of R/3, starting with R/3 3.0D.
- **Haht Software, Inc.** in Raleigh,

SAP, page 54

Hostile applets call for caution

By Sharon Gaudin

Hostile takeovers aren't just the stuff of Wall Street moguls and summer movies. They're also the stuff of bad software components and IT nightmares.

There has been been a lot of recent talk about the problems of downloading "hostile" components. Now information technology managers and analysts offer advice on fending off the system nightmares caused by these applets while cruising through the World Wide Web.

Security issues surrounding Java applets and, more recently, Web components based on Microsoft Corp.'s ActiveX technology, are prompting concern in the IT world. Applets and components, which are reusable software chunks, are gaining popularity because they speed up and ease development. But a component with a built-in virus could wreak havoc with a company's entire system — it could shut down computers, eat up memory, change information stored in databases or plant viruses that could pop up months later.

Source: industry experts

ActiveX components are often considered more powerful — and more dangerous — than Java applets because ActiveX components sit on the operating system instead of in the browser. Anything a Windows application can do, an ActiveX component also can do. This gives developers with hostile intentions a lot of power over a company's system.

A Microsoft spokesman said the company is working to tighten security. But until those security questions are answered, it is up to every business to protect itself.

"Hostile components are a problem that are not going to go away, but, on the other hand, it shouldn't stop you from doing things," said David Kelly, an analyst at Hurwitz Group, Inc. in Newton, Mass. "When you're out cruising the Internet, it's like the Wild West. You've got to protect yourself in a variety of ways."

For now, the only way to be 100% safe from these security breaches is to abstain from downloading anything. That, however, won't fly with most developers who want the latest and greatest at their fingertips and are tempted with these components that are easily and freely downloadable from the Web.

Most of the components up there now are virus-free, and many come directly from Microsoft. But other developers post their own components, and downloading them is a gamble that many developers can't resist. For them, the answer lies in knowing the author of every component and resisting the temptation of the unknown.

Resist temptation

Kelly explained that developers should never download a component that isn't signed by a known author. ActiveX has a system of digital signatures that can be set to warn users before components are downloaded and indicate a component's source. The key is to not be tempted to bypass that warning system.

"There is a temptation to just go ahead and try it," said David Schrier, a project manager for Rye, N.H.-based Black Diamond Consulting, Inc.

To protect himself, Schrier also takes precautionary steps to deal with any hostile viruses he may download. Besides daily system backups and virus checks, he also downloads all components onto a stand-alone computer an nothing on his network could be harmed.

Tom Obrey, chief operating officer at PixelMedia, Inc. in Portsmouth, N.H., protects his system by keeping the power to download all to himself.

"Being a technology-oriented company, we spend every moment of every day on a machine ... and we can't have some silly components mucking with them," said Obrey, who maintains a central repository for tried-and-trusted components.

Batten down the hatches

Researchers found a series of security flaws in Java that Sun Microsystems, Inc. has since fixed in the January release of the programming language.

In the ActiveX realm, a developer has been demonstrating online (www.halcyon.com/mclain/ActiveX) an ActiveX component that can shut down a computer if it is downloaded from the Web with Microsoft's new Internet Explorer 3.0 browser (CW, Aug. 19).

Microsoft officials said they are working to close the security gap created by this so-called hostile component. — Sharon Gaudin

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SAP throws mix-and-match party

CONTINUED FROM PAGE 53

N.C., announced an Internet application development environment. It lets R/3 users create Web-based programs that directly interface with a company's existing R/3 system. Using the new development tools, a pharmaceutical company, for example, could allow physicians to access information about medications via the Internet. Pricing is $2,495 per central processing unit and $995 per user.

Holiday present

SAP will begin delivering the new Business Framework Architecture with R/3 3.1, which is scheduled to ship in December.

- **New Dimension Software** in Irvine, Calif., announced an R/3 version of its Control-M production control and scheduling package. The software automates scheduling of R/3 reports written in SAP's ABAP programming language. It also coordinates report production in mixed computing environments with both R/3 and legacy systems. The Control-M option for R/3 software is available now. Pricing begins at $5,000.
- Also on the Internet front, **OneWave, Inc.** in Cambridge, Mass., demonstrated its OneWave Extension for R/3. Priced at $25,000 per developer, it lets users of R/3 Versions 2.2 and higher create Internet and intranet applications that are integrated with R/3 enterprise data.

SAP officials said the company will build and sell its own set of packaged R/3 Internet applications. These include applications for cross-industry business requirements, such as employee access to personnel and benefits information. The first Internet programs are scheduled for December.

Target applications

SAP also will develop different industry-specific applications, initially targeting users in the health care and financial services businesses, officials said.

SAP Vice Chairman Hasso Plattner said users can choose the SAP or third-party applications that best suit their requirements.

"We want to create a functionality competition," Plattner said.

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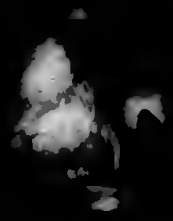

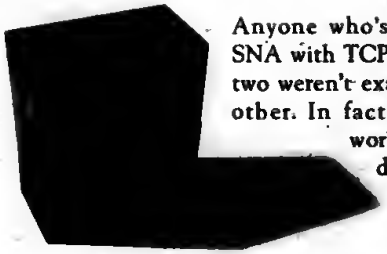

Anyone who's tried to combine SNA with TCP/IP can tell you the two weren't exactly made for each other. In fact, getting them to work together can be a daunting challenge.

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Mac memory booster gets an upgrade

But performance worries, potential system conflicts leave some users wary

By Lisa Picarille

Triple the memory on your Macintosh for about $60.

That's what Connectix Corp. is offering with an updated version of its best-selling Macintosh-based memory management utility. The RAM Doubler 2 utility offers settings that let users triple the memory on their computers when running native Power Macintosh applications.

The utility accomplishes this increased memory capacity by reclaiming unused memory from open applications to run additional applications. Version 2 also takes memory that is unlikely to be used again and compresses it, said officials at the San Mateo, Calif., software company.

Ram Doubler 2 uses a new proprietary compression technology that the company claims runs twice as fast as the previous version. Version 2 also includes a new control panel that streamlines the process of adjusting memory settings.

This type of software memory utility is popular because it lets users run more applications than the physical RAM allows. Although the price of physical memory has dropped to about $60 to $70 per 8M bytes of RAM from $320 last year, some users of older Macintoshes may not have enough single in-line memory module slots available to add more physical memory to their systems, observers said.

However, one user said the lower price of memory and the fear of potential system conflicts have him resisting software memory management utilities.

> **"We discourage our users from increasing memory through software solutions because of potential conflicts with other applications."**
>
> *— Mark Stelzner, Gruener & Jahr*

"Purchasing these types of products was more of an issue s year ago when memory was expensive. But now physical memory is so cheap that it's almost s consumable item," said Mark Stelzner, editorial publishing director at Gruener & Jahr USA Publishing in New York.

"We discourage our users from increasing memory through software solutions because of potential conflicts with other applications," he said. "And when older machines can't be upgraded with physical memory, we just cascade them down to less demanding applications."

Watchful eye

Other users said they were skeptical of software solutions that claim to increase memory because products of this ilk, particularly for the Windows platform, have received serious criticism recently.

For example, Syncronys SoftCorp. in Culver City, Calif., came under legal fire and had to pull its SoftRAM 95 product off the shelf because it didn't live up to its claims of significantly increasing RAM.

RAM Doubler 2 has s suggested retail price of $99 and an estimated street price of about $60. Users of the previous version of RAM Doubler will get $25 off the purchase price when they upgrade to Version 2.

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Sun

SGML tool: One document, several formats

By April Jacobs

Microstar Software Ltd. is launching a new version of its SGML software called Near and Far Author to make it easier and cheaper for companies to manage and publish their documents in a variety of formats.

Standard Generalized Markup Language (SGML) is an authoring language that lets users publish information in different formats. It is a close cousin to the now popular, but more limited, Hypertext Markup Language (HTML). The software saves users authoring time by letting them transform documents into several formats without doing it by hand.

After a document is created, a user can save it as a Word document or an SGML document with Microstar's Near and Far Author 2.0 for Microsoft Corp.'s Word.

The document can also be integrated with Documentum, Inc.'s document management system. Users can publish into document type definitions and HTML formats, as well as store, manage and distribute documents as print or World Wide Web pages within the document management system.

Providing answers

At Eastman Kodak Co. in Rochester, N.Y., for example, Near and Far Author is used to create documents based on customers' frequently asked questions (FAQ). The documents are made available on the Kodak Web site (www.kodak.com) and in a printed version.

"This way, we create one document and put it out in several formats," said Terry Badger, director of technical information at Kodak. That way, support staff can refer people with questions about Kodak products to an automated facts system, which would give a detailed and uniform response to their questions.

Solid market

The SGML market, including software licenses and consulting revenue, is estimated at between $50 million and $75 million by the end of this year, according to David Yockelson, a vice president at Meta Group.

"If you can trim two or three minutes off of a call in your call center, that becomes money," he said.

Badger, who deals with documents that are sent to customers, said he is considering the document management feature in the new version because it will let him communicate better with his document content developers while they are working.

Badger said Kodak staff spends a lot of time creating hot links and working on content creation and navigation. He said he would like to automate the process.

Good enough

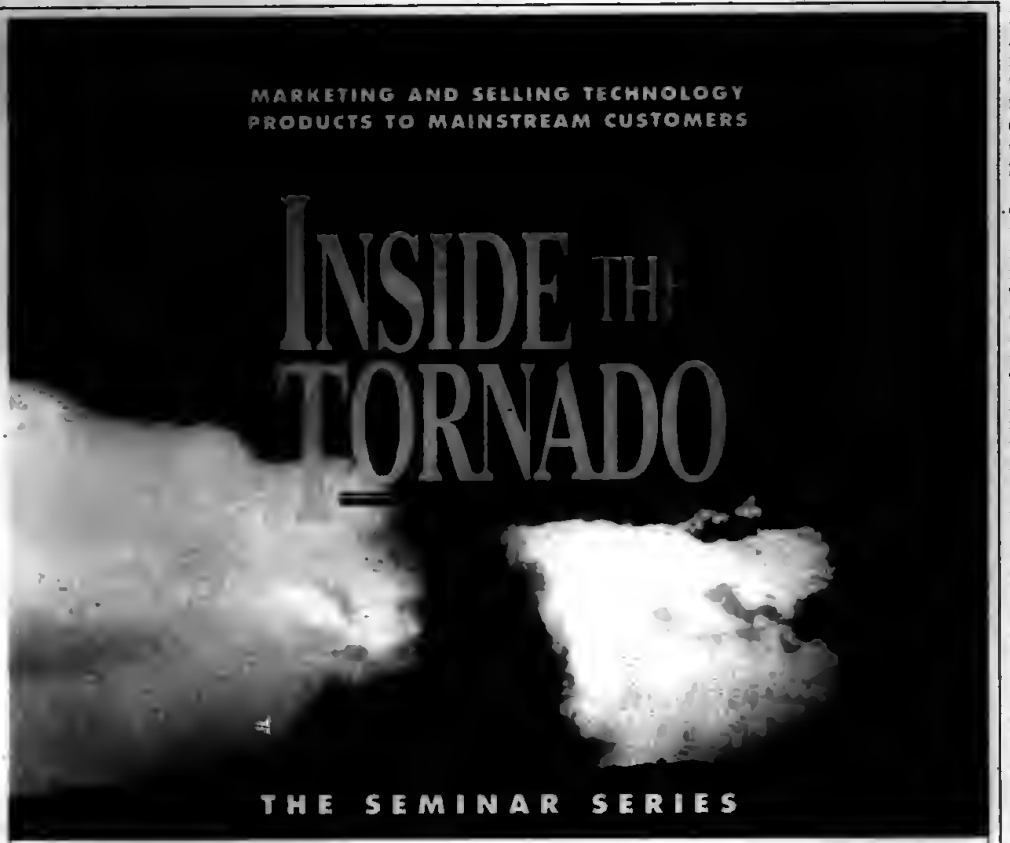
Badger said he is generally happy with the current version of Near and Far Author, but he questions its ability to handle documents that are more complex. But he said for average documents and management it is appropriate.

David Yockelson, a vice president at Meta Group, Inc. in Stamford, Conn., said Kodak is an example of a company where content is received in a variety of ways and must be republished in different formats to support customers. That is a good way to employ document management and SGML, he said.

Yockelson criticized Microstar for compromising some performance for a gain in user friendliness.

"I think they're trying to provide an environment where you can do a lot more in a friendly fashion. And on a grand scale, that's a reason for them to be heading into a mass market," Yockelson said.

"Once it's managed properly, it's very useful," he said.



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Users gain from Madge switch enhancements, 66

The Enterprise Network

Growing vines

Availability: Oct. 1

Price: $9,995 for 100 users

Includes: StreetTalk for NT directory, improved file system and TCP/IP protocol support

Banyan to fortify Vines

By Tim Ouellette

Banyan Systems, Inc. won't keep users of its Vines network operating systems hanging.

Vines 7.0 will ship early next month, and it won't be the last upgrade, company officials said.

The Westboro, Mass., firm has beefed up Vines 7.0 to handle larger file systems beyond the previous 2G-byte limit.

Version 7.0 also supports long file names, allows more server configuration controls and improves support for TCP/IP as the network protocol.

But the biggest selling point to keep users swinging with Vines is the release of Banyan's StreetTalk Directory Services for Windows NT. "We are a Vines shop with 210 Vines servers," said Brian Rudowski, a network specialist at Public Service Electric & Gas Co. in Newark, N.J. "Now we are looking at StreetTalk for NT. Right now, NT's domain services are not a complete solution."

Network operating systems

Although users have been integrating Windows NT servers with Vines networks, NT doesn't offer strong directory service. Instead, users must manage NT domains — with the promise of an enterprise directory by next year.

Stan Schatt, an analyst at Computer Intelligence in La Jolla, Calif., recently said Vines won't lose a lot of ground to NT just yet because of NT weaknesses such as directory services.

Vines 7.0 will cost $9,995 for a 100-user license.

Overnight summation

Kaspia automated network management suite gives an early warning of problems

By Patrick Dryden

Start-up Kaspia Systems, Inc. last week launched an automated network performance monitoring suite that acts like a smoke detector to give managers early warning of problems.

The Kaspia Monitoring System gathers available statistics overnight from managed devices throughout a network.

Then it reports the highlights and details via the widely accessible World Wide Web.

Proactive system

A few vendors, such as 3DV Technology, Inc. in Nashua, N.H., have introduced early-warning monitors, but analysts called Kaspia's system more complete.

Such help lets harried network managers start acting proactively, by allowing them to examine trends and abnormalities instead of having to react to failure alerts.

"We like the idea of overnight reports so we know some problem may be on the way," said Tom Shoop, director of systems engineering at Western Union Information Services in Paramus, N.J.

Some vendors offer these advisories with Unix-based tools, but Kaspia seeks a broader range of users by requiring only a Windows NT platform.

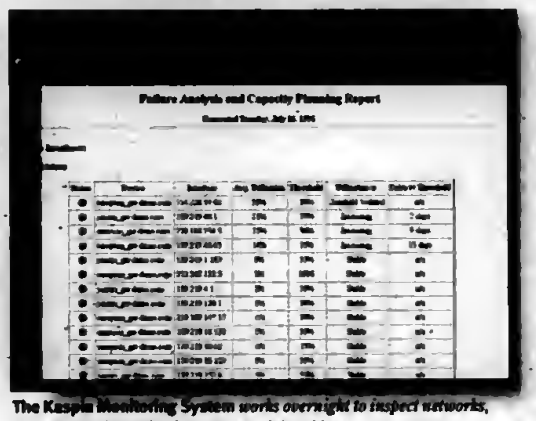
A combination of simplicity, automation, Web reporting and Windows NT support led UB Networks, Inc. in Santa Clara, Calif., to adopt the Kaspia Monitoring System for resale to its users, said officials from each company.

Western Union learned about Kaspia's tools through its hub vendor. The money transfer business wants these tools to collect vital statistics from devices at remote call centers.

That will "give us graphical profiles of the network and let us watch performance trends over time," Shoop said.

A daily summary of performance quirks, called the SmartReport, should prove "incredibly helpful" to IS managers who are trying to prevent network difficulties, said Sue Al-

Kaspia, *page 62*



The Kaspia Monitoring System works overnight to inspect networks, gather statistics and point out potential problems

Novell brings tech support to Web

By Laura DiDio

In a bid to broaden service and support, Novell, Inc. recently launched CNE Net, a Web site designed to give NetWare users a constant flow of product information and technical support.

The aim of CNE Net is to go beyond the textbook information users get when they take a Certified NetWare Engineering (CNE) class, said William Donahoo, senior director of product marketing at Novell.

"CNE Net picks up and continues when the formal CNE classes end. This is another channel to provide network administrators with support by giving them the latest information on NetWare enhancements, patches and fixes," he said.

Administrators who have been certified by Novell can join CNE Net free, Donahoo said. CNE Net members can access the World Wide Web site and a chat room. Members also will get select beta-test and prerelease versions of pending releases of NetWare and current versions of the network operating system. Other perks include specially discounted technical support — CNE Net members may receive as much as 50% off all technical support calls and online incidents and a 15% discount off admission to NetWare User International and CNE conferences.

- Access to the CNE Net Web site, located at www.novell.com/cne
- Beta-test products and early releases
- Automatic distribution of patches and fixes
- 50% discount on technical support calls and online incidents
- Access to free and discounted technical seminars and programs
- Free subscription to *NetWare Connection* magazine

Users and analysts applauded the move. They said it puts more muscle behind Novell's service and support, which has been considered something of a weak spot for several years.

"It sounds good. Anything Novell can do to disseminate [technical] information ... and make NetWare more accessible is a boon for users like myself," said Josh Turiel, director of information services at Ad Life Marketing in Norwood, Mass.

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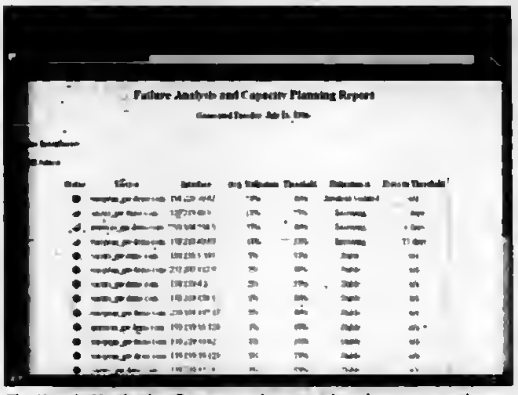

The Kaspia Monitoring System *works overnight to inspect networks, gather statistics and point out potential problems*

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Novell, *page 66*

Kaspia management suite uncovers problems

CONTINUED FROM PAGE 61

drich, an analyst at Patricia Seybold Group in Boston.

This report reminds operators what to check and where to focus, Aldrich said. "An IS manager can hand that report to the network experts and tell them to investigate and check off each item by the end of the day."

Kaspia Systems in Beaverton, Ore., delivered its tools last week.

Pricing for the tools starts at $14,500 for software that can track up to 32 devices such as hubs, routers and Remote Monitoring probes.

Kaspia Monitoring System requires a hefty PC platform — one equipped with a 133-MHz Pentium processor, 32M bytes of memory, a 1.6G-byte disk drive, CD-ROM drive and high-resolution monitor.

But many managers of growing networks call these PC-based management systems cheaper and easier to run than Unix workstations.

Kaspia's launch gives buyers an alternative to the popular Unix-based Network Health tools from Concord Communications, Inc. in Marlboro, Mass., analysts said.

While their performance monitoring approach is similar, Kaspia is positioned more to "the LAN side" for smaller networks of routers and hubs than Concord, which "drives the WAN side quite successfully," said Brian Burba, a management analyst at International Data Corp. in Framingham, Mass. "On both sides of the router, the need is equally large for simple, automated reporting about what's not working well or nearing failure," Burba said.

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New Products

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Pricing for Infinite InterChange starts at $399 for 10 users.

▶ *Infinite Technologies*
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D-Link Systems, Inc. has introduced ProFast 8-Port Hub.

According to the Irvine, Calif., company, ProFast 8-Port Hub is an unmanaged Fast Ethernet hub designed to give data-intensive workgroups an entry into 100M bit/sec. Fast Ethernet. It features an uplink port for cascading a maximum of two hubs and increasing port density to 15 ports within a limited space. This lets network managers increase workgroup speed and performance.

ProFast 8-Port Hub costs $995.

▶ *D-Link Systems*
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McAfee Associates, Inc. has introduced VirusScan 2.0 for Macintosh.

According to the Santa Clara, Calif., company, VirusScan 2.0 for Macintosh is an antivirus software package that protects against the latest viruses, including macro conventional and Trojan horse viruses. It lets administrators distribute task icons as electronic-mail attachments with the latest virus updates.

It has several scanning options, configuration flexibility and automatic virus removal.

Pricing for VirusScan 2.0 for Macintosh starts at $49.

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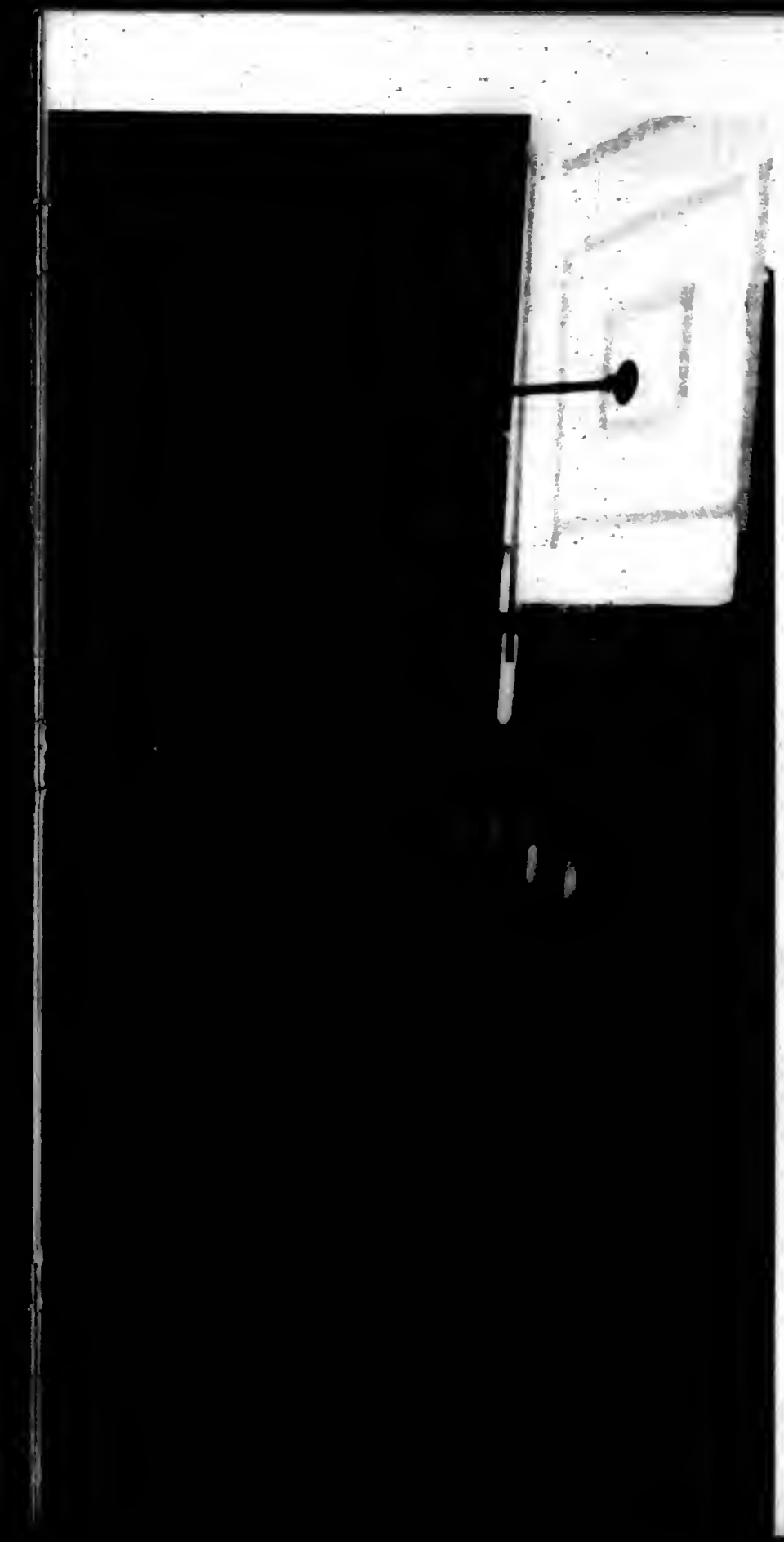
Remember when you got up in the morning and felt like you could conquer the world?



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Users gain from Madge switch enhancements

By Bob Wallace

Token Ring switching pioneer Madge Networks, Inc. last week announced major enhancements to its flagship switch that will make it a far more flexible center for internal building and campus backbone networks.

The business benefit for current and prospective Madge users is that they won't have to buy more equipment to create a more versatile enterprise network.

Madge developed the Smart Ringswitch years ago to give IBM shops that encountered congestion on their shared 4M and/or 16M bit/sec. Token Ring LANs a performance boost via dedicated bandwidth.

Bandwidth conservation

One enhancement lets network managers conserve bandwidth by restricting the broadcast of unnecessary network traffic. Another adds support for fiber cable. A third lets users monitor the performance of the switch, and a fourth lets users link it to high-speed networks.

John Ferrier, distributed systems manager at Scottish Equitable, said the new feature set gave him "the flexibility to design a resilient and manageable network." He said the fiber support was beneficial because his firm uses fiber and twisted-pair wire.

The market for Token Ring switches is showing healthy growth as users gradually replace shared-media Token Ring hubs with higher-performance switches, according to industry research (see chart).

One key enhancement is called Active Broadcast Control (ABC), which reduces unnecessary network traffic such as the broadcast data continually sent by routers over wide-area networks.

Users get performance monitoring via Remote Monitoring (Rmon) support. It lets network managers monitor switch performance on a per-port basis. That helps them spot potential problems and isolate existing ones.

Support for fiber cable in user networks comes in the shape of the Fiber Token Ring Module. This enables users to support fiber and shielded and unshielded twisted-pair building wiring, which means they won't have to replace their existing fiber with twisted-pair wire.

Also due from Madge this month is a Fiber Distributed Data Interface (FDDI) Uplink that lets network managers tie the Smart Ringswitch to FDDI backbone networks and to centrally located high-speed servers.

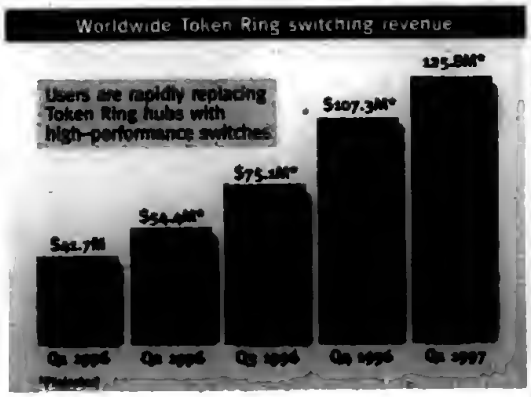
It can also be used to tie together multiple Smart Ringswitches to form expansive backbone switch networks.

Previously, users needed to add another stand-alone device to link the systems.

Madge has additional plans for the Asynchronous Transfer Mode (ATM) Uplink, which would provide the same functionality as the FDDI Uplink, but at 155M bit/sec. instead of FDDI's 100M bit/sec.

ABC now ships with every new Smart Ringswitch. The fiber module costs $4,450; Rmon functionality costs $1,450. The FDDI Uplink costs $5,950. All three are available now.

The ATM Uplink will cost $5,950 and will ship in the first quarter next year.



Source: The Dell'Oro Group, Menlo Park, Calif.

Briefs

Road warfare

Road warriors are accustomed to communications and connectivity problems, but international travel poses a particular challenge. Now, Xircom, Inc. in Thousand Oaks, Calif., has shipped its answer — the International Modem Travel Kit, which costs $129. The kit, which is packaged in a travel pouch, contains 12 international telephone adapters that convert connectors to a standard RJ11 telephone jack. The kit also includes a guide to international connectivity with advice on international communication and travel. It lets Xircom PC Card modem users connect to 160 phone systems worldwide.

D-Link slashes prices

Switch vendor D-Link Systems, Inc. in Irvine, Calif., recently announced plans to slash by half the price of its Fast Ethernet hub and workgroup switches. The price of D-Link's ProFast 10/100 switch, which has four switched Ethernet and one switched Fast Ethernet port, will be $995, a 50% reduction. Its ProFast 12-port Fast Ethernet hub will cost $1,295, down 28% from $1,795. The vendor's eight-port switched Ethernet hub will cost $1,195, a 25% price cut.

Artful Windows NT 4.0

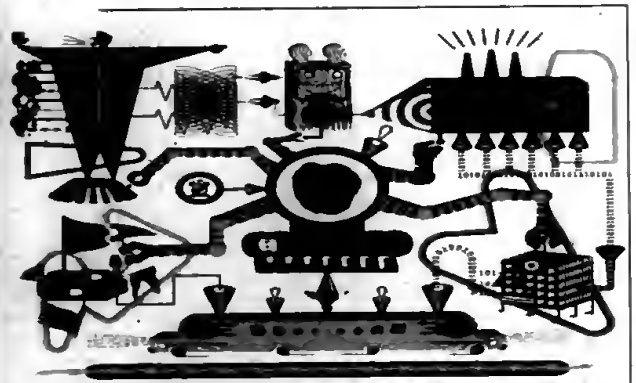
Artisoft, Inc. in Tucson, Ariz., by year's end will release versions of its LANtastic peer-to-peer network operating system and its Insync CoSession Remote, a remote access package, said company official Olivier Zitoun. Both will support Microsoft Corp.'s Windows NT.

Workgroup manager expands

Backup functions and the latest version of Windows NT are supported by a new workgroup management tool kit from Boston-based Seagate Software, a subsidiary of Seagate Technology, Inc. Version 2.0 of the Desktop Management Suite (DMS) includes Backup Exec for managing data on various operating systems at workstations and on Windows NT and Novell, Inc. NetWare servers. DMS supplies remote control, inventory and asset management, software distribution and virus protection. Pricing for the Desktop Management Suite starts at $1,495 for 50 users.

Maxed management

NCR Corp. in Dayton, Ohio, and Maxm Systems Corp. in McLean, Va., have teamed up to market Maxm's Max/Enterprise management software to users of NCR's WorldMark servers. The deal complements NCR's software for managing central or remote Unix systems because Max/Enterprise automates fault management for internetworking gear and nonstandard devices.



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Novell brings text support to Web

CONTINUED FROM PAGE 61

tion that the company is beginning to really pay attention to businesses' grassroots concerns," he said.

Turiel, who also heads the Boston chapter of the NetWare Users Group, said many network administrators — him included — don't have NetWare certification.

"A large proportion of network administrators are too busy doing their jobs and minding the network to take the time to get CNE certification," Turiel said.

"However, the inception of a program like CNE Net tells me that Novell is getting steadily better at delivering aftermarket service and support. And I'm certainly interested in getting a 50% discount on technical support calls," he said.

"Novell's technical support, until now, has been a real search expedition. NetWare fixes and patches always seem to be hidden in these obscure forums, and it takes hours to find them. If CNE Net can solve that problem and quickly get me fixes and enhancements, I'd be a very happy administrator," said an MIS manager at an East Coast financial firm, who requested anonymity.

Transaction processing vendors make good on 'net promises, 7n

Log-on reason No. 96

H & R Block subsidiary to launch new Web site, giving small banks a shot at 'net commerce

By Mitch Wagner

A new service designed to let small banks conduct personal finance business with consumers over the Internet is on its way from a subsidiary of tax preparer H & R Block.

Block Financial Corp. in Kansas City, Mo., plans to launch the Conductor site in the fourth quarter. The service will provide a one-stop shop for consumers, who will be able to log in to the site and pay bills and perform account transactions at multiple banks.

Block's Jake Geller: *switching from Netscape server software to Microsoft's Internet Information Server will mean fewer vendors to deal with*

More revenue

The business value for Block is additional revenue and market cachet. Block will charge banks to participate in the program, and it will attract higher-income customers than those who currently use Block's tax-filing service. Consumers will be charged fees for services such as bill payment and financial information.

Banks will be able to use Block as a fast and easy means of getting themselves set up for Internet commerce. Block plans to target the service to small banks that lack the information systems resources of the half-dozen or so large banks that are pioneering Internet commerce.

"This allows small banks to essentially outsource transaction processing and maintenance of their [World Wide] Web servers," said William P. Anderson, president of Block Financial.

Bill-payment services are nothing new on the Internet. BankAmerica Corp. and Wells Fargo & Co. both launched similar services this summer. But those services are tied to a single bank, which doesn't help consumers who have accounts, credit cards and loans at multiple banks.

Answer for small banks

The Block service is also cutting-edge because it will offer an outsourcing solution for putting small banks on the 'net.

"They're creating a financial mall that's simple to navigate and simple to use," said Phoebe Simpson, an analyst at Jupiter Communications, Inc. in New York. The key to Block's success will be whether it can sign up a sufficient number of banks to achieve critical mass, she said.

Block hopes to sign 100 to 200 banks by launch time. The service is being beta-tested by Mascoma Savings Bank, a 13-branch chain in New Hampshire and Vermont with $345 million in assets.

"We know that in our area, there's a lot of interest from our customer base

Block, *page 70*

Users pounce on Navigator for OS/2

By Kim S. Nash

High fives went up among many OS/2 users when Netscape Communications Corp. last month announced it will offer an OS/2 edition of the popular Navigator Web browser.

Several users said they would jump on the new product.

"Netscape looks better to me" than IBM's own OS/2 browser, WebExplorer, said Richard Schafer, an avid OS/2 user and owner of MailBook, Inc., an electronic-mail company in Houston.

Not only will they get market-leading World Wide Web software, but OS/2 users who upgrade to the forthcoming "Merlin" release of the operating system will get the browser for free. Merlin is due Sept. 25.

But others crabbed that Netscape and IBM dragged their heels. And some OS/2 users decided they couldn't wait.

IBM's WebExplorer was nice, but many other non-Web development and systems management utilities don't run on OS/2, said William Clardy, information systems manager at

OS/2, *page 68*

Now hear this

The forthcoming OS/2 version of Netscape Navigator has a speech feature that lets Pentium users surf the Web via voice commands

Product	In beta	Final shipment	Java support
Navigator 2.02 for OS/2	This month	November	Extra fee not yet determined
Navigator 4.0 for OS/2	This fall	By year's end	Free

Virus protection

The end of summer means virus season is approaching. For humans, that is. For computers, viruses can strike year 'round. But despite all the panic and arm-waving about the dire threat of computer viruses, most of them do very little damage – and the damage can be still less if you catch them early. Fortunately, the Internet abounds with tools for that.

Symantec Research, at www.symantec.com, makes the shareware Integrity Master – unusual in the line of antivirus products. For one thing, it runs on DOS but can run in DOS mode on all flavors of Windows and OS/2. It can detect the extremely rare viruses that run on those operating systems (most viruses attack DOS). The DOS compatibility means it's built for speed rather than comfort.

It's still fairly easy to use, with pull-down menus and context-sensitive help. Integrity Master can also be set to measure the vital statistics of every file on your hard drive and then return to look for changes. It's a valuable tool to test for tampering by hackers or to look for the effects of viruses.

Dr. Solomon Associates, Inc., has shareware versions of its antivirus software at www.drsolomon.com. The software runs on DOS, Windows 3.x, Windows 95 and Windows NT, OS/2, Macintosh, Solaris and the public-domain Linux. The company also has software to automatically scan for the presence of viruses in E-mail or on the Web.

IBM Antivirus, IBM's F-Prot Professional shareware is available for DOS, Windows 3.x, Windows NT, Windows 95 and NetWare, at www.fsecure.ru/f-prot/. The company also has a free scanner for the Hare virus, due to hit Sept. 22.

VCI Technology Corp.'s Thunderbyte shareware is at thunderbyte.com. It's available for Windows 3.x, Windows 95, DOS and Microsoft Exchange.

– *Mitch Wagner*

Corporate IS frets about Java security, frowns on applet use

By Frank Hayes

Amid concerns about Java security, some corporate IS shops are cutting off their users from Java applets on the Internet.

Last month, aerospace giant The Boeing Co. in Everett, Wash., told its 10,000 Internet users to disable support for the small programs written in Java. Sun Microsystems, Inc.'s Internet development language.

"It's not just Java. It's our policy for employees not to download software into a Boeing environment from any source outside the company without proper precautions," said Bob Jurgensen, a Boeing spokesman.

"We told our employees, 'until we finish all our work on it, when you're out browsing, have Java disable as the default position.' That still gives them the ability to use it when they're at the site of a known vendor or on our intranet," he said.

Better safe than sorry

Information systems shops are concerned because researchers at Princeton University have found flaws in Java security that could give outsiders access to corporate data or cause other problems. Although no major incident caused by a Java security breach has been reported, some users are taking no chances.

Earlier this year, the Australian telephone company Telstra Corp. and the U.S. Defense Intelligence Agency both confirmed that they have banned Java among their users until security questions have been answered.

But Boeing is still using Java for development inside the company, where there is no danger of security breaches.

And other security-conscious organizations, such as the Department of Veterans Affairs and the Defense Information Systems Agency, have given a green light to their own Java development efforts.

"Our researchers said they didn't think we had a problem," said Craig Moore, security officer at the Department of Veterans Affairs, Austin Automation Center in Austin, Texas. Java applets that pose a security risk "don't appear to be very insidious or prevalent," he added.

Still, other organizations, ranging from biotechnology labs to auditing firms, are configuring their corporate firewalls to block Java applets.

A firewall is a gateway that connects an internal network to the Internet. It can be set up to select which kinds of messages can pass through.

Using a firewall is an alternative to publicly declaring a ban on the use of Java, said Ed Maillet, a network manager at Idexx Laboratories, Inc., a biotech company in Westbrook, Maine.

"The firewall system we're using blocks Java at the firewall, and we don't allow users to get around it using a modem. That kind of action is grounds for dismissal," Maillet said.

A firewall also allows Java to continue to be used in World Wide Web pages within the organization and allows the Java-blocking to be centrally administered.

Meanwhile, Sun Microsystems' JavaSoft division is fixing security holes as quickly as they appear and is also working on more comprehensive ways of improving Java security.

"We want to get beyond our current penetrate-and-patch approach," said Marianne Mueller, a JavaSoft security engineer.

The firm is working with outside security firms to tighten security further, she said.

Strike up the ban

Where Java is banned:

- The Boeing Co. (still uses Java internally)
- U.S. Defense Intelligence Agency
- Telstra Corp.

Where Java is welcome:

- 3M
- U.S. Defense Information Systems Agency
- U.S. Department of Veterans Affairs, Austin Automation Center

Briefs

Netscape unplugs Shockwave

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Infoseek to launch indexing product

Infoseek Corp., which runs a search service on the Internet, has launched a new version of its search engine for beta-testing. Infoseek Ultra is available online at ultra.infoseek.com. Like competitor AltaVista from Digital Equipment Corp., the Infoseek product indexes every word on tens of millions of individual uniform resource locators (URL). But unlike the competitors, Infoseek Ultra weeds out duplicate entries and narrows 80 million URLs to 15 million unique pages. Infoseek said it plans to update its index often; AltaVista updates often run weeks or months behind.

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OS/2 for Navigator

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On the server side, there are several freeware Web servers, including one from IBM. But none of the primary server vendors, such as Microsoft, Netscape or O'Reilly & Associates, Inc., makes an OS/2 product.

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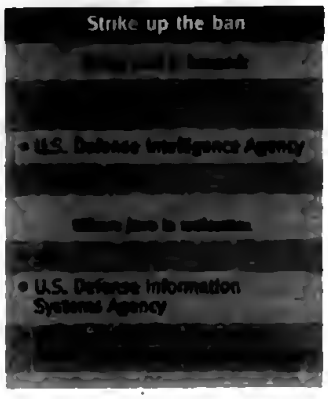

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They promised to link their software with the 'net, and now . . .

Transaction monitor vendors start to deliver

By Craig Stedman

Transaction monitor vendors are starting to deliver on promises to link their software with the Internet. And several interested users said they like what they see so far.

The transaction processing software holds the potential for orchestrating 'net-based applications that would be both scalable and secure. Transaction monitors sit in the middle of three-tier applications, routing requests from clients to servers and handling a variety of other functions (see chart).

Scalability

That sort of middleman role looks to be just what the doctor ordered for the World Wide Web, according to several users.

"The anorexic client model of computing looks essentially like the mainframe environment with a terminal and a host server. I don't think that's going to be scalable enough for our applications," said Mike Child, director of information technology planning at BellSouth Advertising and Publishing Co. in Atlanta.

Transaction monitors are especially useful in applications that require clients to access multiple databases on different servers, Child said.

The company, which publishes BellSouth's phone directories, is considering using NCR Corp.'s Internet-enabled Top End software so internal decision-support users can get at its data warehouse via Web browsers, he added.

Corporate Express, Inc., an office and computer supplies distributor in Broomfield, Colo., hopes this year to start implementing a Web-based order-entry system built around BEA Systems, Inc.'s Tuxedo transaction monitor.

With the transaction software in place, "you can start up more and more processes at one time" without fear of overloading your system, said Chuck Nelson, a member of the technical architecture team at Corporate Express.

Tuxedo's encryption and user authentication capabilities also help reduce security concerns about the Internet, he added.

Corporate Express lets its customers place orders via dial-up links from PCs or IBM 3270 terminals. The Web browser approach will enable customers to use their client platform of choice, Nelson said.

Meanwhile, Corporate Express can reuse its existing back-end Tuxedo business logic and provide access to the transaction software via client-level Java applets, he added.

Traffic cop on duty

Transaction monitoring software performs these services:

- Routes transaction requests and responses between clients and servers
- Balances workloads among multiple servers
- Supports two-phase commit to ensure that transactions are completed
- Handles user authentication and authorization across distributed networks
- Supports global administration and distributed applications management

BEA, which took over development of Tuxedo from Novell, Inc. earlier this year, introduced its Java-based BEA Jolt software in August.

An initial release supporting basic transaction processing from a Web browser is due to ship in November; versions that take advantage of more Tuxedo services and support Java-based server applications will follow in the first half of 1997, BEA officials said.

The Jolt product followed the release earlier this summer of NCR's Top End for the Internet, which supports Java and Common Gateway Interface clients.

IBM also is getting into the act with gateway software that lets Web browsers access 3270-based CICS transaction applications. Groupe Bull's UniKix unit is doing the same thing for its CICS-compatible software.

For some users, however, processing transactions over the Web still requires a leap of faith.

Burlington Coat Factory Warehouse Corp., a retailer in Burlington, N.J., is a big Tuxedo user and has potential future interest in using BEA Jolt to do business on the Internet.

"But there's a little bit of thinking that the market isn't quite ready for that yet," said Michael Prince, director of information systems.

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Block to launch new Web site

CONTINUED FROM PAGE 67

in online banking," said Carol Cone, vice president of operations at Mascoma Bank, which has headquarters in Lebanon, N.H.

The system runs on four Microsoft Corp. Windows NT servers and Netscape Communications Corp.'s Web server software in Block's Kansas City headquarters.

The firm is moving toward Microsoft's Internet Information Server to reduce the number of vendors on which it must rely. "You have the benefit of only having to deal with one vendor to work through any problems you might have," according to Jake Geller, chief technology officer at Block.

The system runs using custom middleware that Block wrote using an object request broker to connect with standard banking back-office systems. Block now connects to back-office software from Jack Henry & Associates, Inc., which serves 1,250 banks nationwide.

For bill payment, Block subscribes to Checkfree Corp., an electronic bill-payment service. The connection between Block and the banks is over private leased lines for reliability and security.

New Products

Site Technologies, Inc. has introduced SiteSweeper 1.0, a World Wide Web site manager.

According to the Durham, N.C., company, SiteSweeper 1.0 detects broken links and identifies incorrect image references.

It goes to Web sites, gathers complete information on all files and reports back file types and sizes and the last modification dates.

Pricing starts at $299.

▶ *Site Technologies*
(919) 416-3113
www.sitetech.com

Baranof Software, Inc. has introduced MailCheck: Intranet Edition, an electronic-mail management software suite.

According to the Watertown, Mass., company, the product was designed for corporate intranets. It gives users monitoring, service-level reporting and management capabilities. The product gives users information about all servers and remotes.

Pricing for MailCheck: Intranet Edition starts at $695.

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New Products

Trancell Systems, Inc. has introduced WebRamp IPX Gateway, an Internet access product for Novell, Inc. NetWare users.

According to the Santa Clara, Calif., company, WebRamp IPX Gateway is a network drop-in device that eliminates the need to reconfigure existing NetWare networks for Internet access. It integrates all the functions of a LAN hub, IP/IPX gateway and IP router in a single device.

WebRamp IPX Gateway includes software for streamlining all workstation and Integrated Services Digital Network (ISDN) connections and configuration and administrative tasks.

WebRamp IPX Gateway supports up to 20 simultaneous NetWare users and includes eight 10Base-T connections, an IP router, the IPX gateway and an ISDN Basic Rate Interface.

Pricing starts at $1,495.

▶ *Trancell Systems*
(408) 988-5353
www.trancell.com

Ulysses Telemedia Networks, Inc. has announced Odyssey Suite, an independent World Wide Web-based groupware product for intranets.

According to the Minneapolis company, the suite combines a contact manager with calendar and reminder applications.

Odyssey Suite gives mobile users wide access to their applications from the road, through PCs, Macintoshes or Unix machines.

It integrates with corporate intranets and with the Internet and can handle an unlimited number of users.

Pricing starts at $1,500 for the server software and $150 per user.

▶ *Ulysses Telemedia Networks*
(612) 359-0870
www.ulysses.net

NetSpeak Corp. has announced WebPhone 2.0.

According to the Boca Raton, Fla., company, WebPhone 2.0 gives users a real-time, business-quality, full-duplex voice communications system with point-to-point connectivity over the Internet.

It has off-line voice mail and conference-call features, call transfer and password protection.

It also has a noteboard for interactive party-specific text chat and a World Wide Web browser help application to assist users when they place calls.

Pricing for WebPhone 2.0 starts at $50.

▶ *NetSpeak*
(407) 997-4001
www.netspeak.com

Dagar Software Corp. has introduced Disconnect, a Windows-based utility for Internet users.

According to the Bethany, Conn., company, Disconnect automatically terminates idle online and Internet connections after time intervals set by the user.

It prompts the user with two visual and audio warnings, then severs the connections. It has separate settings for all major online services and lets users set different time limits for each.

Disconnect works with Microsoft Corp.'s Windows 3.1 and Windows 95. It costs $30.

▶ *Dagar Software*
(203) 393-2000
www.dagar.com

Brief

Directory assistance

CCOM Information Systems has opened up corporate directories to users of World Wide Web browsers. The Iselin, N.J., company recently added two tools — Intranet Directory Publisher and PhoneLine for the Intranet — to its existing Master-Directory offering. Together, the software lets administrators collect data from telephone, LAN, electronic-mail and database directories and then publish the information to the corporate intranet. Users can access the data from a Web browser, based on defined filtering requirements. The suite costs $9,995 for a 500-user license.

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Hong Kong Jockey Club bets on monitoring software, 76

Corporate Strategies

Health Insurance Plan's JoAnne Olson: *'We spent so much time going through paper it wasn't funny. It still isn't funny.'*

HMO cures service, claims processing ills

By Thomas Hoffman

Until recently, Health Insurance Plan of Greater New York (HIP) resolved only 10% of its 2,000 daily customer service calls on the first try.

The firm's membership services unit was severely understaffed, and customer service representatives were stuck with an inflexible character-based call center system that made it nearly impossible to provide fast and accurate telephone support to HIP's 1.1 million members.

It gets worse. HIP's claims department was also floundering. Even though the group stored more than 90% of its 3 million annual claims electronically, it didn't have an inventory system to locate the other 200,000 paper-based claims.

So if a provider complained about not being paid, it was easier for the nonprofit health maintenance organization (HMO) to produce another claim than to find the original. As a result, multiple claims were being processed, and the same claims were often paid twice. That cost HIP more than $2 million annually in duplicate claims.

"We weren't managing the information well, and we weren't helping our members," acknowledged JoAnne Olson, assistant director of member relations at HIP.

To fix its problems, HIP went on the attack with a series of technical and pro-

HMO, *page 76*

Briefs

ISO 9000 aid unveiled

MK Group, an independent business division of Computer Associates International, Inc., introduced several products at CA-World '96 in New Orleans last month. MK is a computer-aided quality assurance module aimed at helping midsize manufacturers achieve ISO 9000 certification. An advanced warehouse management module was also added to MK.

CSC to process claims

Computer Sciences Corp. (CSC) won an outsourcing contract to process managed Medicaid claims for Gateway Health Plan in Pittsburgh. Under terms of the agreement, CSC will provide information services, data warehousing, decision-support systems and other services to Gateway from its Albany, N.Y., data center. Terms and the length of the agreement weren't disclosed.

Smooth move

Users generally pleased with CA/Legent merger

By Thomas Hoffman

What a difference s year makes.

When Computer Associates International, Inc. acquired rival Legent Corp. last August, information systems managers from coast to coast expressed healthy doses of fear and concern about the new owner.

The fear was that CA would jack up prices on Legent software, given its already commanding share of the mainframe systems management market. The concern was that CA would stop enhancing Legent products and milk the customer base for maintenance revenue.

IS managers also worried that Legent product support would drop once CA took over. But so far, most IS managers are giving CA s thumbs-op for the way it has handled the $1.8 billion deal.

Most IS managers seem pleased, if not surprised, by CA's support of Legent products.

One IS executive who has weathered "some stormy times" with CA has seen his situation clear since the Legent acquisition. Wade Brown, executive vice president and chief information officer at Washington National Insurance Co., said the Lincolnshire, Ill., company came within a week of ditching its CA-1 tape management system for Legent's Epic tool set last summer. The problems stemmed from "several sticky contractual issues," about which Brown declined to elaborate.

But during the Legent transition, Washington National was able to resolve its contractual differences with CA and elected to stick with CA-1. Brown, who credits CA President Sanjay Kumar with patching up relations with his company, calls the CA/Legent deal "one of the smoothest transitions I've ever come across."

Like most mergers and acquisitions, where customers are assigned new service representatives, it took s few months for CA's support of Legent products to fire on all cylinders. IS managers such as Gerald Verchick at Nevada Power Co. complained early on that CA's support of Legent products such as System Output Archival and Retrieval had trailed off.

Since then, CA's product support has rallied, although there is still room for improvement, said Verchick, MIS facilities manager at the Las Vegas-based utility. Legent "took s more proactive view of users," he added, noting how his former vendor "would ask questions like, 'Do you need a PC version of this tool?' We're still not getting that from CA."

The merger "has been one of the smoothest transitions I've ever come across."

— Wade Brown
Washington National Insurance

A handful of CA-Endevor customers expressed concern at the CA-World '96 user conference last month that CA was pumping too many resources into its thriving CA-Unicenter systems management suite while skimping on enhancements to the change management tool.

"I'd like to hear more about [enhancements to] Endevor and fewer sales pitches about Unicenter," said Joseph A. Mallon, manager of change management at United Technologies Sikorsky Aircraft in Stratford, Conn.

CA is working on enhancements to CA-Endevor, including plans to ship a Unix version of the change management package by early next year, said Yogesh Gupta, senior vice president of product strategy at CA.

Jockey Club bets on monitoring software

By Veronika Trinkle
HONG KONG

The Royal Hong Kong Jockey Club is keeping a tight rein on its soon-to-be-launched, redeveloped betting system by using system monitoring and management software from BMC Software, Inc. in Houston

The Jockey Club opted in June to use Patrol, an off-the-shelf application management software package. It will be fully implemented sometime later this year, said John Markwell, director of information technology at the Jockey Club.

"We are putting in an open distributed environment and system management facility, and such things are quite complex. So we need the Patrol software to basically help us manage the distributed network," Markwell said.

The Jockey Club is overhauling its transaction environment, bridging legacy systems with a high-availability client/server system. The rollout began in February and is scheduled for completion in October.

Tight management

Patrol was designed to monitor and manage most of the databases and operating systems on the market, including Windows NT, OS/2 and several versions of Unix.

"Even more important for the Jockey Club, it can monitor unique business applications that have been developed in-house," said Alex Wu, BMC's regional manager for Greater China.

The Jockey Club operates a three-tier client/server environment with high-end Digital Equipment Corp. 8400 servers for the heavy-duty transaction processing workload, Wu said. "These are networked to midrange Digital 2100 and IBM RS/6000 servers to provide distributed processing of the large numbers of Intel Corp.-based systems in the betting outlets and offices around the territory," he added.

Patrol will initially manage the betting

Dave Matthews

system, which is a major part of the Jockey Club's IT system, Markwell said. The IT department may extend Patrol's monitoring activities to other aspects of the network.

"We're spending a lot of effort on getting up to speed on how [Patrol] works," Markwell said. "We will not actually roll out Patrol everywhere in a huge deployment until we have a better grip on it and have considered the cost structure. At the end of the day, it has to be cost-effective."

Trinkle writes for *Computerworld Hong Kong*

For the enterprise, Web-based clients still have their limits

By Kristi Essick
SAN FRANCISCO

Will the World Wide Web browser become the strategic, one-size-fits-all client for the enterprise?

Considering the speed with which companies such as Oracle Corp., SAP AG, Baan Co., Dun & Bradstreet Software and PeopleSoft, Inc. are racing to "Web-ify" the client side of their high-end client/server applications, it appears vendors think so.

Transactional processing

But although the intranet may become the network of choice for many large companies in the next few years, most analysts and users said large-scale client/server applications for transactional processing will always have a place in a company's network.

Some of the benefits of a Web-based client include reduced costs, less complexity for network administrators and employees who use the product, and standardization of proprietary architectures into Internet standards. Almost all of the client/server applications companies have a strategy to put a Web browser front end on their products, but it may be a while before users can expect full transactional functionality from a browser client, analysts said.

"Web interfaces can't possibly give access to all the functionality you can get now with transactional tools," said Dave Folger, an analyst at Meta Group, Inc. in Stamford, Conn.

A manager responsible for maintaining an SAP R/3 business applications system acknowledged he would be enthusiastic about using a Web browser client for several of the product's services.

"We are definitely planning on implementing a Web-based client by next year for some of the applications, such as the sales functions," said Kevin Moore, IS manager at Cataphote, Inc., a plastics maker in Jackson, Miss.

Still, most users agreed it will take several years before they trust confidential information to an intranet-based application.

"The intranet is no threat to the applications we use from Oracle right now, such as their large financial application" said Peter Ho, senior network specialist at Unocal Corp. Unocal has a wide-area network that connects sites in North America, Europe and Asia and uses an intranet mostly for human resources functions.

"Oracle and SAP are adapting to the changing tide of the Internet by slapping a Web front end on their products, but we still want the trusted engine in the back and not Web-based applications," Ho said.

Essick writes for the IDG News Service.

HMO

CONTINUED FROM PAGE 75

cess changes over the past three years. Earlier this summer, HIP made some modest cuts to member premium rates, helping it remain one of the least expensive HMOs in New York.

HIP dramatically improved its call center operations and claims processing activities by installing front-end graphical user interface (GUI) systems and an imaging system. Today, 95% of all member calls are answered immediately.

Fixing up PC-to-mainframe interfaces with customer service in mind may seem like a no-brainer approach to the problem, but HIP isn't the only health care organization grappling with the issue.

While HMOs have helped spearhead the shift by vertical industries to focus on customer service, the health care industry lags behind catalog retailers and insurance companies when it comes to equipping representatives with GUIs and access to legacy customer information, said Jane Metzger, director of emerging practices at First Consulting Group, a health care management and IS consultancy in Waltham, Mass.

To get started on its makeover, HIP looked over its mainframe-based member services system, which didn't even log member calls online. If customer Mary Jones called three or four times to resolve a claim, HIP customer representatives would have no record of her previous calls. They had to "shout across the room to other reps to see who spoke to Mrs. Jones that morning," Olson said.

To track those calls online and put membership data within reach, HIP built a front-end system using Essel Corp.'s GUI tools. As part of the $3 million project, started in 1993, HIP also installed Wall Data, Inc.'s Rumba gateway software to connect customer reps to as many as eight mainframe-based membership history applications. Member information stored on a Sybase, Inc. relational database management system is accessed through a Compaq Computer Corp. Proliant server.

To supplement the technology upgrades, HIP also doubled the number of trunk lines to its customer reps and quadrupled its member services staff.

Claims gains

Once its membership services operations were on track, HIP began chasing its biggest paper tiger: claims.

In January 1995, HIP began using a claims document tracking module from the Sybase RDBMS that stores member information. The module was linked to a Minolta Corp. MI3MS 3000 imaging system through a 175-seat LAN to store and track manual claims.

Since the $800,000 Minolta imaging system went live in January 1995, HIP has saved $2 million by virtually eliminating duplicate claims, Olson said.

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HEWLETT® PACKARD

Client/server helps insurer crank out reports

By Julia King

It used to take accountants at Allmerica Financial Corp. 16 business days to close the books at the end of each month.

On the 17th day, top managers at the $17 billion company got their internal reports, and staffers in the corporate finance department got cracking on the next month's numbers. Like most other reports, these were generated by a mainframe-based system, which was updated once each night and could be accessed only by a programmer or business analyst.

Then, in 1994, it was decided that the mutual insurance company would be converted to a stockholder-owned company. That would mean additional regulatory reporting requirements. It would also entail furnishing information on a timely basis to financial analysts and others outside of the Worcester, Mass., financial services firm.

"We had more pressure to produce reports in a more timely fashion [because] we had a more visible audience," said Lucy Van Laarhoven, vice president of accounting and general ledger control.

In short, it would mean installing a new financial information system.

> *"If we were taking 23 or 24 days to get our information out and other companies were taking less, we were going to be viewed as not having our act together."*
>
> — Rick Leif
> Allmerica Financial

"Good or bad, the analysts want to know what's going on. They want to make recommendations on our stock and performance," said Rick Leif, vice president of information systems.

"If we were taking 23 or 24 days to get our information out and other companies were taking less, we were going to be viewed as not having our act together," he explained.

Solution at hand

So last year, Allmerica launched a major reengineering initiative, which included implementing PeopleSoft, Inc.'s client/server financial applications.

Ease of use was a key reason for choosing the software. But it wasn't the only one. Before buying, Allmerica wanted proof that the system could handle its transaction volumes. Subsequent in-house tests showed that 100,000 post and 100,000 edit transactions took 30 minutes each — adequate to handle Allmerica's requirements.

Allmerica implemented the client/server system on Sun Microsystems, Inc. Unix machines running an Oracle Corp. relational database. The system went live this past Jan. 1.

Today, thanks to business process changes — such as speeding up the allocation of companywide expenses — and a distributed computing environment that lets business managers access and update information on an ad hoc basis, Allmerica's managers receive accurate monthly reports seven business days sooner than before.

And fewer people in corporate finance are dedicated to generating reports. Instead, workers in the business units do much of the work themselves, using reporting tools built in to the PeopleSoft applications.

"Before, if someone wanted a complex report, they could wait months for it to be written and tested," Van Laarhoven said. "In this environment, they can get data faster themselves and look at it the way that they want to look at it."

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Web Watch
Check out some practical Web-surfing sites for IS managers. See page 84.

Steven Curtis

LEARNING *to* LEAD

What makes a leader? Some students in IS training programs focus on learning about themselves, not dishing out orders / By Jeremy Schlosberg

Bart Westberg got the point as if it smacked him on the head with a textbook.

Westberg, director of enterprise systems at Sprint Corp. in Kansas City, Mo., took part in Sprint's weeklong Leadership Institute. An instructor asked, "If you were to view the beginning and the end of your life as bookends, what are the titles of the books on that shelf?"

Westberg's abashed realization: "I just had two books on my shelf." There was a "big, fat volume" that said "Sprint" and another that said "family." (He and his wife had a 4-year-old, a 2-year-old and an infant at the time). Sitting in a classroom, talking about balancing your life and achieving personal development is a powerful experience.

The lesson is one of many being nudged home in leadership training seminars for information systems managers. The bookshelf lesson, Westberg says, shows that "if you focus too much on just one or two things, you are absolutely going to burn yourself out. You are not going to be successful."

Learning to lead, *page 82*

Learning to lead

CONTINUED FROM PAGE 81

Philosophers have long debated whether leaders are born or made. But some IS executives are voting for the "can be made" ticket by sending up-and-coming managers to leadership programs.

IS isn't alone. Last year, 72% of U.S. companies with at least 100 employees sent managers to leadership training, *Forbes* magazine reported in April. According to *Forbes*, management and leadership training is resurging since the recession in the early '90s slashed corporate training budgets.

In particular, the Society for Information Management's (SIM) Regional Learning Forums have gained a following. Since they were launched in 1992, the forums have graduated more than 160 people. Another 76 graduates are expected later this month at SIM's annual conference in San Francisco.

SELF-DISCOVERY

SIM doesn't focus on molding a corps of Eisenhowers and Pattons but on allowing students to discover themselves and what they need to lead.

Program graduates talk about how they were energized and recommend the forums to others. "Everyone who comes out of it feels like they've grown tremendously," says Mary Anne Luczak, first vice president of First Chicago NBD in Chicago, of her SIM experience. "Yes, it's hard to quantify. But it does work."

If you want to train IS managers in leadership skills, what can you learn or copy from these programs?

First and foremost, IS leadership programs concentrate on so-called "soft" issues — how people relate to others. This is true of any leadership training but is of special importance for IS professionals.

"The human element introduces a randomness that's difficult for people with technical backgrounds to get a grasp on," says Luke Novelli, who teaches a course on project leadership at the Center for Creative Leadership (CCL) in Greensboro, N.C.

It can also help in working with fellow executives. Just ask Kathryn Collins, vice president and chief information officer at Community Kimball Healthcare System in Toms River, N.J.

Collins attended a College of Healthcare Information Management Executives (CHIME) seminar in 1994. She had leadership skills then, but the "comprehensive and intense" course helped her articulate an information technology vision for her company, which includes two acute-care hospitals with 950 beds and a 100-bed psychiatric facility.

Without the course, she says, she wouldn't have been promoted to her current job.

COMING TO 'AHA'

SIM students, split among four geographic regions, attend six two-day sessions each year starting in January. The forums take a heuristic approach, or learning through discovery, says Bart Bolton, a forum facilitator in Upton, Mass. The discussions, role-playing games and other parts of the forums help students reach their "Aha!" moments, when they discover something about themselves.

When the forum begins, Bolton says, "You never know what you've got sitting there, and it's interesting to see it evolve."

The CCL course is four days and concentrates on often-subtle interpersonal communication issues such as body language, eye contact and how to approach others nonconfrontationally. "We use a realistic presentation," Novelli says, namely, a computer-based behavioral simulation that engages participants in a hypothetical project and allows a detailed analysis of each student's "performance."

A favorite Bolton technique is a "negotiation game." Six participants split into two teams, playing by a set of rules that can be changed as the game progresses. After the bargaining begins, Bolton sometimes swaps a member from each team and sees whether he or she will volunteer secrets from the old team or if the new teammates can coax secrets out of them. The lesson: It can show some of the students' "true colors" and prod some of them into deeper conversations.

CCL's course, as does SIM's, also teaches technical managers to understand themselves. Introspection, in a way, is the program's underlying theme — the idea that "this is first and foremost about you — who you are, what you aspire to be," says Mike Carleton, director of the office of information technology at the U.S. Department of Health and Human Services in Washington. "Then you translate that self-knowledge into your own management style."

These programs also expose students to new ideas and insights. SIM attendees must read an eclectic reading list of more than 40 books, which are discussed by the same group of 16 to 24 participants at each meeting. (The titles include the John Steinbeck novel *The Pearl*, and Steven R. Covey's *Principle Centered Leadership*). The meetings also include candid talks by IS executives and others about life in IS management.

BRINGING THEM TOGETHER

Diversity is another characteristic of these programs. When they don't bring together people from different companies, they gather managers from different backgrounds.

Catherine Lewis, manager of global portfolio planning at Xerox Corp., has overseen the development of her company's leadership training program for technology managers, which is based closely on SIM's. She works to ensure that people of different ages, races, genders, backgrounds, organizational levels and nationalities attend.

In IS, she says, "we tend to hang around people who are a lot like us." But managers intent on improving their leadership skills are going to learn far more about mobilizing teams by interacting with a diverse, rather than a homogeneous, group.

Disrupting normal work patterns to learn can change how people think. Entering the SIM program, Luczak was all but convinced that there was no room in her 90-hour work week for this sort of personal development. At the beginning, breaking away for two days every month was extremely difficult for her. In the end, those days showed her she could, in fact, "find time for education and for some balance in my life."

Understanding the importance of keeping work in perspective may end up being the greatest lesson a leadership training program can teach.

Westberg might agree. He says before he entered the leadership training program, "work was the No. 1 and only thing." Now he takes a more sensitive approach to project management.

Before, he and others worked feverishly through nights and weekends to meet deadlines. Now, there is more emphasis on how to plan better so that they won't be stuck in the office.

The week in leadership training, he says, allowed him to come away with "a completely new perspective." ■

Schlosberg is a freelance writer in Cincinnati.

LEADING*the*WAY

Executive leadership training programs and courses come in three basic varieties:

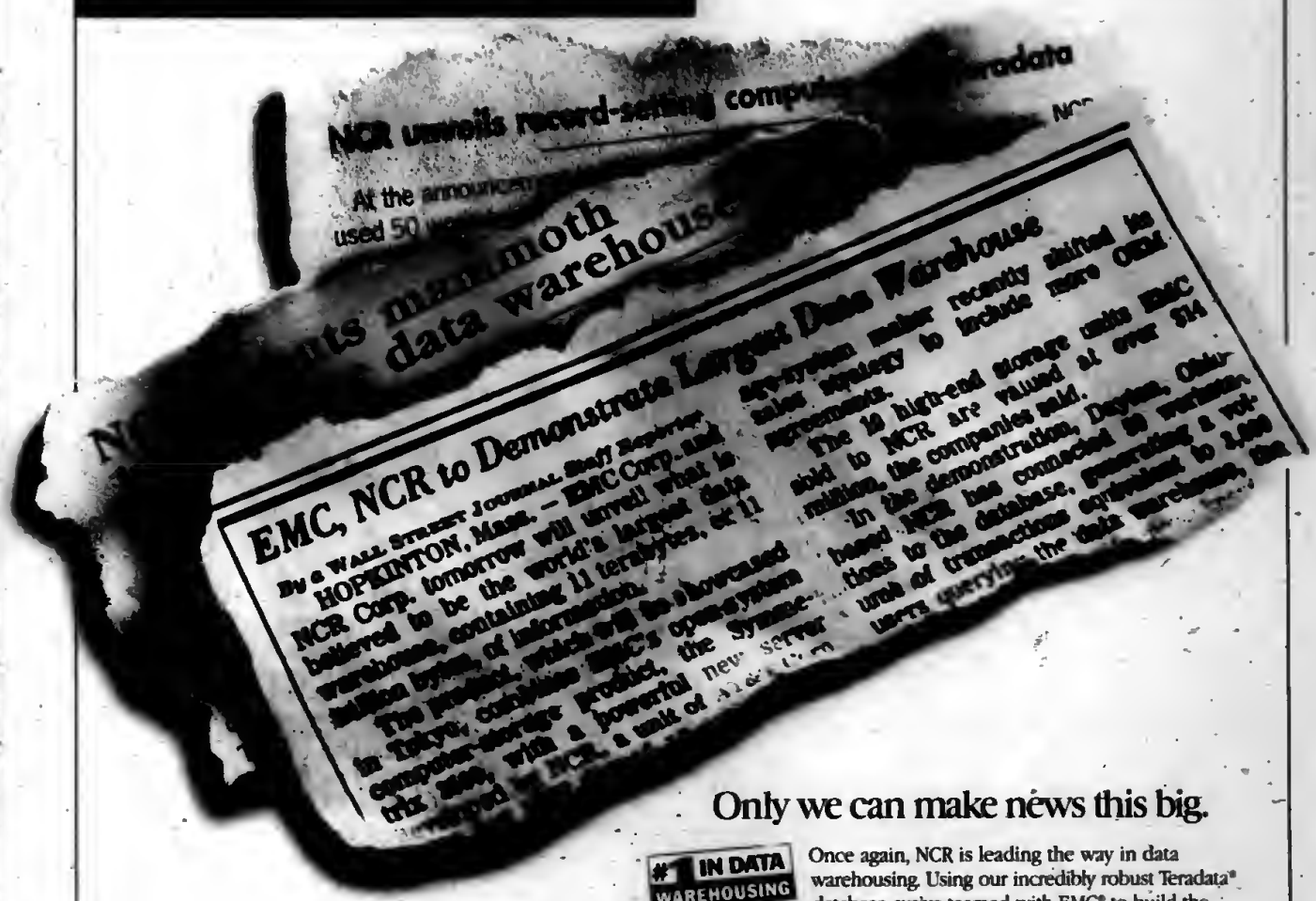
- At or sponsored by independent executive education organizations (such as the nonprofit Center for Creative Leadership).
- At established universities.
- Internal corporate programs (such as General Electric Co.'s Leadership Development Center).

Within IS, the pickings also emerge from these areas but grow somewhat slimmer. The profession's most visible attempt at leadership training is the Regional Learning Forum program run by the **Society for Information Management** in Chicago. Each forum is a series of six two-day sessions spread over several months. Cost: $5,000, which includes all class materials, breakfast, lunch and a two-year SIM membership.

Other programs range from a four-day, $3,200 course at the **Center for Creative Leadership** called "Project Leadership" (known until this year as "Leadership for Technical Managers") to a specialized master's degree program introduced last year at **Northwestern University** called "The Communication Systems Program," which involves two academic years of once-a-week, full-day classes. Tuition: $18,000 a year.

CHIME (College of Healthcare Information Management Executives) offers a seminar in Ann Arbor, Mich., for IS managers. Cost: $1,995, $1,695 for members of CHIME, HIMSS (Healthcare Information and Management Systems Society) and CHIM (Center for Healthcare Information Management).

The NCR Scalable Data Warehouse.


NCR unveils record-setting compu
Teradata
its mammoth
data warehous
EMC, NCR to Demonstrate Largest Data Warehouse
By a WALL STREET JOURNAL Staff Reporter
HOPKINTON, Mass. – EMC Corp. and
NCR Corp. tomorrow will unveil what is
believed to be the world's largest data
warehouse, containing 11 terabytes, or 11
million bytes, of information.
The prototype, which will be showcased
in Tokyo, combines EMC's operating system
computer-storage product, the Symme
this week, with a powerful new server
unveiled by NCR, a unit of
storage units EMC
recently shifted its
sales strategy to include more OEM
agreements.
The 18 high-end storage units EMC
sold to NCR are valued at over $14
million, the companies said.
In the demonstration, Depose, Calif.-
based NCR has connected 48 machine-
cess to the database, generating a vol-
ume of transactions equivalent to 3,000
users querying the data warehouse, the

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NCR

intel inside
pentium

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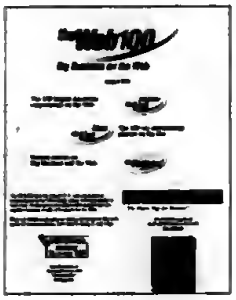
By Leslie Goff

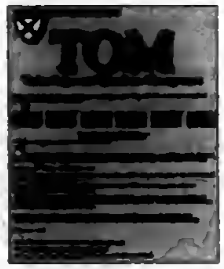
Practical Internet Sites for IS Managers

America's Web 100
Tox.NSTN.Ca:80/~at_info/



Moments when you wish they made Cliff's Notes for information systems professionals: You have two hours to prepare for a meeting to discuss Internet strategy with your company's all-twenty-something World Wide Web site development team, and you want to be informed when you show up. Use this directory of the top-grossing U.S. and global corporations that have pages on the Web to get up to speed. Each list is cross-referenced by industry and offers links to the sites, which makes it a snap to find out what your competitors are up to.

Harvard Business School Technology and Operations Management Home Page
rigoi.hbs.harvard.edu/



Now that school is back in session, perhaps the webmaster at this site — which focuses on the relationship between technology and manufacturing operations — will do something about the all-text design. It makes the home page a bit tedioos to wade through. But if you persist, you can find enough reading material to get your intellectual juices flowing such as "The Coordination of Global Manufacturing," "A Flexible Structure for Computer-Controlled Manufacturing Systems" and "Fault Diagnosis and Computer-Integrated Manufacturing." The working papers that are available to the public (some parts of this site are available only within Harvard Business School) are a few years old but still on the leading edge, if not the cutting edge, of the issues. The online case studies are also restricted, but general surfers can peruse a sample that analyzes Digital Equipment Corp.'s Internet strategy and contains many links to other relevant sites. The best feature here, and one that should be expanded, is a virtual ootebook in which surfers can leave their responses to the Digital study. After you work out your brain, check out TOM's executive education courses.

HRLive
www.jwtworks.com/hrlive/index.html/

Getting ready to hire a fresh crop of college grads? Or about to let go of some longtime employees? Get a fresh perspective on the employment landscape at this site, which is chock-full of reports, statistics and other truly useful information, such as a weekly nationwide layoff report detailed by industry; a listing of the top recruiting markets by industry and profession (for example, the top metropolitan markets for finding computer programmers are Washington, New York and Los Angeles); and a cost-per-hire survey. As the name implies, HRLive is aimed at human resources professionals but is valuable to anyone who deals with staffing issues. Is someone in your group complaining about job-related stress? Print the site's list of the top stress-inducing jobs (rest assured IS isn't among them).

Institute of Management and Administration
www.loma.com/loma/

This site balances the desire to gain customers with the realization that if you are going to have a Web site, you had better be willing to provide some free content. The institute publishes business and management reports. Here, it offers samples that are updated frequeotly and contain thoughtful links to sources of more information. In August, for instance, a sample article "How to Develop Cost Effective Network Security Strategies" in the "Managing LAN Costs" oewsletter was linked to the National Computer Security Associatioo's home page. Other IS-related articles cover Windows NT challenges, outsourcing pros and cons of network management and the costs of Java-based networks. IS managers may also take oote of a range of general business and management reports.

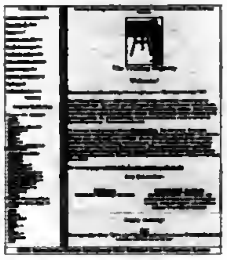
But unfortunately, these articles aren't indexed or categorized. You must scroll through the titles until you find one that suits your fancy. Another area with a big readability problem is the links page, which has received a lot of attention for its thoroughness. Indeed, the list of links to other business resources and commercial network enterprises is vast (two pages deep), but they are listed in paragraph form without commas or other separators. A search engine would also go a long way toward making this potentially valuable site even more useful.

Smart Business Superslte
www.smartbiz.com/

Dubbed the "how-to resource for business" site, it offers a little something for everyone. Nearly every colorful icon on the tool bar across the top of the home page leads to useful, relevant material such as columns on electronic privacy, violence in the workplace and internal marketing. You could end up spending a lot of time here reading the articles, which are gathered from a variety of sources and have hypertext links.

But if you don't have much time, click on the browse button to call up a Windows-like menu of subjects. Then choose Computing in Business to get a precise index of all relevant material at the site, from "PC-Based Sales and Marketing Management Improves Results" to "E-Mail Confessions in Court." The Jobs/Careers section includes an article any top IS executive will want to read called "What You Should Know About Executive Search Firms" as well as other articles and a message board. People Finder is a onique section that offers users a venue for locating speakers and consultants. You can even buy your administrative assistant a desk organizer using the online shopping service.

The Training Registry
www.tregistry.com/



This is a uniform resource locator that you'll refer your staff and other managers to as a consolidated resource for locating live classes and multimedia-based courseware. It won't serve all your training oeeds, but it makes a great jumping-off point for comparison shopping. Nearly 300 IS-related courses, in systems development and computer operations and networking, are indexed here along with more than 500 professional development courses and end-user application and Internet training. The site was created as a promotional venue for training vendors, but it serves the business professional by maintaining an informational, noncommercial tone. It offers links to vendors' home pages instead of a sales pitch.

Goff is a freelance writer in New York.

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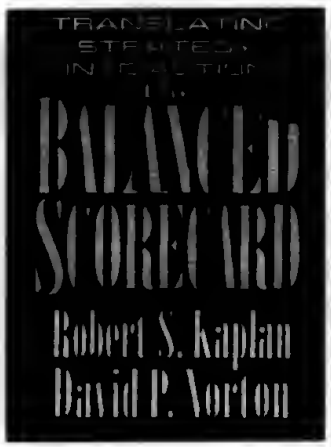
IS Manager's Bookshelf

Measure to manage

The Balanced Scorecard gives a new twist to an old axiom



The Balanced Scorecard: Translating Strategy Into Action

By Robert S. Kaplan and David P. Norton; Harvard Business School Press, Boston; 336 pages, $29.95

An old axiom states, "You can't manage what you can't measure." This book would change that to read, "What you measure largely determines how you will manage."

The authors, both longtime consultants, have repackaged a lot of standard planning techniques and added a couple of new twists that give the techniques marketing appeal. The standard techniques include asking executives to reexamine their mission, strategies and objectives in a disciplined way. Long-range objectives are translated into one-year milestones. Mechanisms and resources to achieve the objectives are identified, and everyone spends a lot of time and effort measuring quarterly results of success.

These measures of success have traditionally been financial, but the authors expand the concept to include a "balanced scorecard" of measures. Scorecard refers to the set of measurements around financials, internal business processes, learning and growth and customers. Balanced refers to the weighing of measures such as internal vs. external, strategic vs. operational, quantitative vs. judgmental, past-oriented vs. future-oriented.

This concept is laid out in Chapter One. Chapter Two provides a rationale for moving from the purely financial measurements that have dominated business.

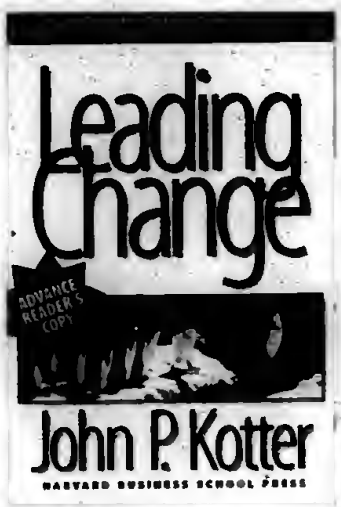
The authors argue, for example, that in the Information Age, assets such as corporate knowledge can't be properly valued. They rightly conclude that most existing measurement systems focus on lower-level employees rather than the entire organization and thus don't foster alignment. In Chapters 3-8, the authors illustrate the approach with case examples.

What's new in this concept of balanced scorecard is the emphasis on organizational feedback and "double-loop" learning. This means not only evaluating current results against the plan but also questioning the underlying assumptions and theory upoo which the plan is based. This is the topic most relevant to information systems managers because much nf it can apply to project management.

Howard Rubin and Associates, the Software Engineering Institute and others long ago developed balanced scorecard models to evaluate information technology performance. It's great to see the business world getting on the bandwagon.

Change ahead?

Leading Change offers a road map for business but few directions for IT



Leading Change

By John Kotter; Harvard Business School Press, Boston; 224 pages, $24.95

This book is an extension of the author's 1995 *Harvard Business Review* article and prior works on the difference between leadership and management.

He delivers an eight-point program for transforming businesses, each illustrated in separate chapters: 1) Establish a sense of urgency; 2) Create the guiding coalition; 3) Develop a vision and strategy; 4) Communicate the change vision; 5) Empower employees for broad-based actions; 6) Generate short-term wins; 7) Consolidate gains and produce more change; and 8) Institutionalize new approaches in the culture. This seems very pat and familiar — but perhaps there is more depth than meets the eye?

Unfortunately, we'll never know because Kotter chose to illustrate the approach with personalized anecdotes from his consulting practice rather than true case studies. What we get are largely conversations with unidentified people in unidentified companies, who (surprise!) nicely restate the author's views. The commeots are certainly lively and frequently have a ring of truth to them, especially when discussing failures or frustrations. But this is a technique more appropriate for an after-dinner speech than a rigorous management text.

A greater disappointment to the information technology manager will be the fact that in all this discussion of change, technology is almost totally ignored. Certainly there must be a role for groupware and networks in communicating the vision. Workflow-based production systems should empower employees in accepting the change. Management reporting systems should help institutionalize the changes, but we'd never know it.

Granted, this gives the book a certain timeless quality that could make it relevant in any number of prior ages. The question is whether it is relevant for the Information Age.

Book reviews are by Leilani Allen, a director at Tenex Consulting in Burlington, Mass. She can be reached at tenex@tenex.com.

Who can take down an entire network with a single keystroke?

Don't believe us? Just ask six million America Online subscribers who recently had to endure a 19-hour blackout after a "glitch in networking software from a router vendor.[1]" Or how about the 400,000 users of another Internet service who experienced a 13-hour crash when someone typed the wrong configuration code for a Cisco router[2]? Unless your organization can somehow afford such sudden and lengthy downtime, maybe it's time to question your own networking operation.

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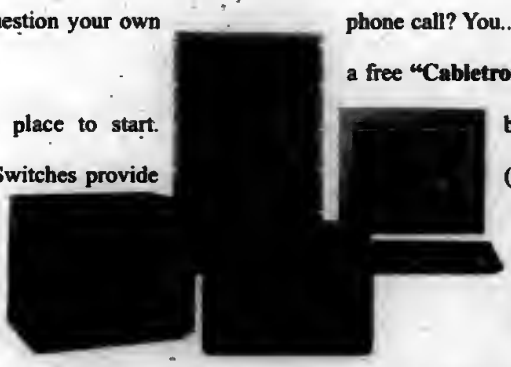

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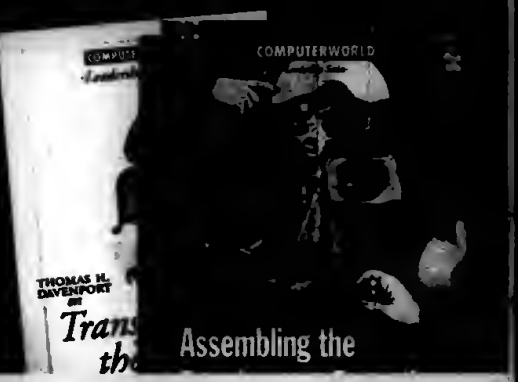
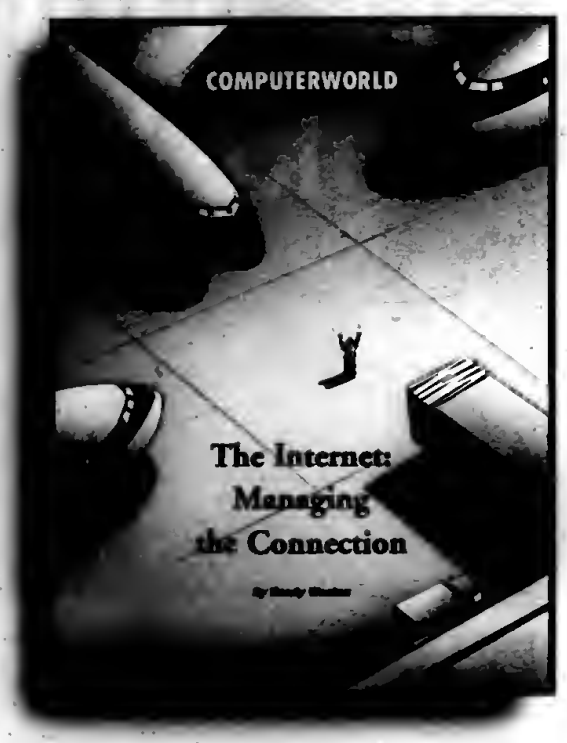
Don't miss Computerworld's Leadership Series





Coming in the September 16th issue of Computerworld...

The Internet: Managing the Connection

Network capacity, employee use, viruses, security and legal liability — issues like these make the question of how to manage Internet access one of the most important concerns facing IS leaders. *Computerworld* explores the Internet management approaches being adopted by major corporations, including Federal Express Corp.

Previous Articles Available

Governance: The New IS Agenda by Paul A. Strassmann
The Role of the CEO in IT Decisions by Bill Carico
Transforming the CIO by Thomas H. Davenport
Knowledge, Information, Learning and the IS Manager by Christopher Gopal and Joseph Gagnon
Into the Infocosm by Glover Ferguson
The Eastern Road to IT by Shuji Honjo
The Enterprise Engineer by James Martin
Building an IT Management Flight Deck by Howard A. Rubin
Rebuilding the IS Organization by Robert A. Zawacki
The Recentralization of IT by Ernest M. von Simson
The New CIO/CEO Partnership by Harry M. Lasker and David P. Norton
Evaluating the CIO by Thomas J. Buckholtz
Staffing for the Future: A Leadership Roundtable by Bruce Rayner
Chaos and the IS Executive by Christopher Meyer
The New Organizational Operating System by N. Dean Meyer
The Future of Moore's Law by Gordon E. Moore and Bruce Rayner
Assembling the Renaissance Executive by Julia King and Robert L. Scheier

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85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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99. Other _____ (Please specify)

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10 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Administrative Services
23. Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60. Sys. Integrators/VA/Re/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner,General Mgr.
12. Vice President, Asst. VP
13. Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
91 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
00. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

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B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
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65 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/ Refining/Agriculture
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
99 Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
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21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Administrative Services
23 Dir./Mgr. Sys. Development, Systems Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Management
60 Sys. Integrators/VA/Re/Consulting Mgt.
CORPORATE MANAGEMENT
11 President, Owner/Partner,General Mgr.
12 Vice President, Asst. VP
13 Treasurer,Controller, Financial Officer
DEPARTMENTAL MANAGEMENT
91 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.
OTHER PROFESSIONAL MANAGEMENT
80 Information Centers/Libraries, Educators, Journalists, Students
00 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)
Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep
App. Development Products ☐ Yes ☐ No
Networking Products ☐ Yes ☐ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

	1 At this location	2 Entire Organization
A. 20,000 +	☐	☐
B. 10,000 – 19,999	☐	☐
C. 5,000 – 9,999	☐	☐
D. 1,000 – 4,999	☐	☐
E. 500 – 999	☐	☐
F. 100 – 499	☐	☐
G. 50 – 99	☐	☐
H. 20 – 49	☐	☐
J. 10 – 19	☐	☐
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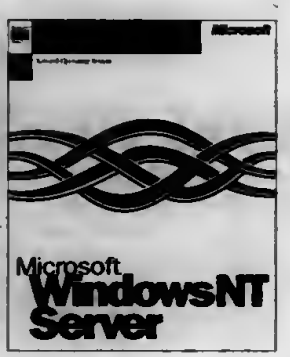
Buyer's Guide

GAINS & GAPS in NT 4.0

NT Workstation
Good platform, but no Plug and Play
Grade: B



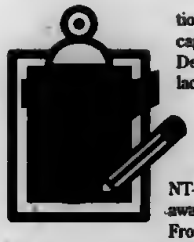
NT Server
Few new features, and they aren't well-documented; expensive upgrade
Grade: B

BY MARK MINASI

Microsoft Corp. has shipped the latest incarnation of its enterprise operating system, Windows NT 4.0, which brings generally good news for people running NT Workstation but mixed news for server users.

Workstation users will like the new Windows 95-style nser interface and snappy graphics.

Server users will welcome the Domain Name Service (DNS) server that's finally included in NT Server 4.0. However, those same users will boo Microsoft's decisios to force firms to upgrade their client licenses at more than 50% of the original price, as well as an architecture modification that may reduce some of NT's popular robustness.



Windows 95 interface

Despite the fact that Windows NT and Windows 95 are two very different operating systems, Redmond, Wash.-based Microsoft has created s Windows NT version of Explorer that nearly matches the Windows 95 implementation.

Changing color depths and screen resolution on the fly, an iffy thing under Windows 95, works smoothly on NT Explorer. NT Workstation also includes some features that Windows 95 users can get only in the Windows 95 Plus Pack. These include font smoothing and high-color icons. Microsoft has added some new applications, such as the 32-bit HyperTerminal communications program and s scanning program. But NT still lacks faxing capability. Unfortunately, one of Windows 95's greatest strengths, Device Manager, is unavailable because Windows NT 4.0 sadly lacks Windows 95's plug-and-play capability.

Internet tools

NT Server's enhancements reveal that Microsoft's affair with the Internet continues. Internet Information Server (IIS), the NT-based World Wide Web server that Microsoft has been giving away for months, is packaged with NT 4.0. Microsoft also bundles in Front Page, its basic Web page authoring tool. IIS is a good basic Hypertext Transport Protocol server, and the fact that it's free will keep the competition on its toes.

Front Page is a simple Hypertext Markup Language editor but with a twist, courtesy of Vermeer Technologies, Inc., the firm that originally made Front Page. Vermeer realized that many people want s few basic capabilities on their Web sites — forms, search engines, time/date stamps — but that putting together even s small Common Gateway Interface program can be difficult for nonprogrammers. So Front Page uses several extensions that make it possible for webmasters to build s site with forms, search engines and the like by including what Vermeer calls "bots" in the Web page. NT Server ships with the Front Page extensions needed to make these bots work.

NT 4.0, *page 90*

NT 4.0

CONTINUED FROM PAGE 89

There is still more in NT 4.0 for Internet users. After keeping it in beta for almost two years, Microsoft has finally shipped a DNS server with NT. It's a bit balky to set up, but this DNS server appears to finally bridge the gap between an Internet-approved name-resolution system, DNS, and NT's internal name-resolution system, Windows Internet Naming Service.

Doubling up

If users want faster access to their Internet service providers, they can attach multiple modems or Integrated Services Digital Network adapters to their NT machine and have them all dial up the provider at the same time. NT then combines the varied data streams into one high-speed data stream. This feature, called multilink Point-to-Point Protocol, is a good idea, but it works only if users' Internet providers support it.

Rounding out the improved Internet tools is the Point-to-Point Tunneling Protocol, which is intended to allow users to build multiple virtual private networks over the Internet. The documentation doesn't really detail how to set it up, but perhaps that will be remedied with a white paper soon after the release of Version 4.0.

Those rolling out dozens of NT installations will welcome Setup Manager and Sysdiff. Setup Manager lets users build response files that answer all installation questions, allowing NT to be installed almost unattended.

Sysdiff makes it simple to do quick mass installations of third-party software. The idea is to use Sysdiff to take a picture of a user's computer configuration before installing an application, then take another snapshot after the installation. Sysdiff then generates a script that can be used to automatically reproduce that installation on other machines. We were unable to test it because there's no documentation available. A Microsoft spokesman said Sysdiff documentation would appear "sometime soon on the Web."

Network troubleshooters will get some help from Network Monitor (Netmon), a reduced-functionality version of the tool currently found only in Systems Management Server. Netmon shows all network packets originating from or directed to a server. Trying to figure out why a workstation can't find a domain controller? Fire up Netmon, and it will provide some clues.

Windows NT 4.0 also comes with a newly enhanced Task Manager that puts system loading information right at users' fingertips. There's nothing there that couldn't be found with Performance Monitor, but the data is better formatted and is right at hand.

Not cheap

Windows NT 4.0 isn't without its bad points. The first, and probably most odious, is Microsoft's decision to force companies to upgrade their client licenses. The hidden cost of upgrading from NT Server 3.x to 4.x won't be in the several-hundred-dollar upgrade price. The big cost will be that customers must buy upgraded client licenses (at $25 apiece) for all users. At that price, if a customer has 10,000 users, it would have to pay $250,000 just to upgrade those users' permission to log on to its NT servers — even if it opgrades only one server to NT 4.0.

Microsoft says although that math is right, the reality isn't. "Any customer that large would be on the Select program, and they would essentially get the upgrades for nothing," a Microsoft representative said.

Some users may be troubled by Microsoft's architectural decision to move print and video drivers from user mode to kernel mode. Microsoft did this so that graphic-intensive applications will run faster on NT Workstation, and they do indeed run faster. But it also means that an errant print or video driver can crash an NT Server. Network managers may feel that the trade-off — an easily crashed server platform in return for better games support — was less than optimal. Microsoft's perspective is that there's really nothing to worry about as long as you stick with drivers tested in its lab. These include printers and video cards on the Hardware Compatibility List.

Windows NT 4.0 Workstation will be embraced by NT Workstation fans. How NT Server will fare remains to be seen, but those who buy it will find it more than adequate for using the Internet and intranets. ■

Minasi teaches seminars, writes books and consults on Windows NT. He is the author of *Mastering NT Server 4.0* and *Mastering NT Workstation 4.0*, published by Sybex. He can be reached at mark@mmco.com.

Simple speaks volumes in Organizer '97

BY JEFFREY GORDON ANGUS

The word to use here is "finally." Lotus Development Corp. has finally gotten past the pretty but marginally useful versions of its time-management software. It has reached a point where Organizer is both usable and useful, especially for users who appreciate simplicity.

Previous versions of the Cambridge, Mass., company's low-end contact and schedule program were easy on the eyes but disappointing to use because complex features such as OLE links didn't work the way you thought they should. Even worse, simple things such as font designations and accessing a day's worth of appointments were difficult or impossible to get.

Organizer '97 adds not only several advanced features but also includes some basics that should have been there before. Although I don't think any time-management and address book programs are stellar, Organizer '97 is a well-designed piece of work that's worth looking at.

As with its competitors, such as Now Software, Inc.'s Up-to-Date and Franklin Quest Co.'s Ascend, Organizer '97 was built to be much like the paper-based personal organizers people carry with them. This approach makes it easier for novices to figure out how to use the program. Familiar tabs such as Calendar, To Do and Address anchor the utility of this computerized system.

For the vast majority of users who spend most of their time within a minute of their desktop, the two key advantages of a computerized organizer are the ability to find any item and to network multiple users' organizers. Organizer '97 does both well, especially the networking, where it offers the ability to share individual sections — as opposed to all or none — and it integrates with electronic mail.

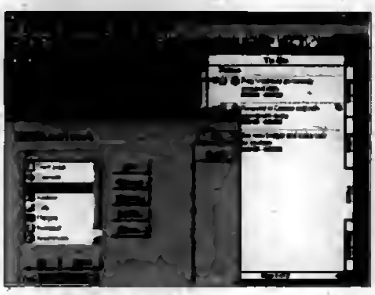
The product also supports a "Links" feature that gives users the ability to connect multiple entries such as an appointment with an address. The design is neither the most elegant nor the finest part of the program's interface, but it's adequate and takes only 10 minutes for a user to master.

What's new?

Lotus finally adds some features that users have long been waiting for. They include the ability to choose a typeface and format for entered text, and being able to view the calender one page per day. This view shows blocked-out times and appointments.

Organizer '97 also has some spiffy new features. You can combine entries from multiple sections for a printout, either a free-form one or one that conforms to a range of existing paper formats that fit popular physical organizers.

The product supports the Telephony Application Programming Interface standard for dialing a number from within the program. And it supports Microsoft Corp.'s OLE for users who are willing to put up with the performance hit.



Users will benefit from Organizer's new smooth interface

A final ooteworthy new feature: Lotus has built Internet integration into the product, so users can embed uniform resource locators into their organizer or pop into Lotus' World Wide Web site (www.lotus.com).

Documentation is more than adequate. The manual is explicit, complete and well-organized. The online help is very good, but it would benefit from the linear, numbered procedure-list methods Lotus has mastered in other applications.

Organizer '97 is a serious competitor in the time-management category. It offers crisp performance and a smooth interface that more often than not doesn't require consulting the manual or online help. ■

Angus is project director at The Data Works Ltd. in Seattle.

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Public Key Mystery

BY DEBORAH KERR

Information security will be a $13.1 billion business by 2000. The men who created the cryptography that drives the industry all have fine reputations and distinguished careers. What they don't have is a lot of money from their invention. **Why?**

It was 1970. Only months earlier, a Hell's Angel at Altamont had twisted the knife that Charles Manson stuck in the back of the '60s. The Arpanet, mainframes and time-sharing terminals ruled in the computer world. Unbeknownst to one another, three men had embarked on separate quests to solve a problem: cryptography.

Through fate and determination, the three eventually got together. Working as a team, they found their answer in the mid-1970s. But they were so forward-thinking, they would wait 20 years for the world to ask the right question.

Now the world has, and public-key cryptography — invented by Martin Hellman, Whitfield Diffie and Ralph Merkle — is all the rage.

So why aren't Hellman, Diffie and Merkle rich?

Merkle, Hellman and Diffie at a June ceremony honoring their invention

Anticipation

In 1970, Martin Hellman, a young professor of electrical engineering at Stanford University in Palo Alto, Calif., had a bushy head of hair and a similar beard. Hellman's pilgrimage had begun in 1968 when he worked at IBM in Yorktown, Pa. There he rubbed elbows with Horst Feistel, the driving force behind IBM's work in cryptography.

When he read Claude Shannon's 1948 and '49 papers on information theory and cryptography, Hellman says, he had an epiphany. "I never before realized how closely related cryptography was to information theory," he says today, watching four-toddler grandchildren make a jungle gym out of his oak-surrounded Stanford faculty home.

The Shannon papers discuss coding to reduce static on the radio. "Cryptography," Hellman says, "is the opposite. You introduce noise through a key. Someone who is listening in and doesn't know the key should be as confused as possible. But the legitimate receiver who knows this secret key is able to remove the static."

As Hellman searched the country for more information, an individualistic MIT undergraduate named Whitfield Diffie was following the same path. But Diffie's quest had started at a much earlier age. "I had been interested in cryptography ever since I was 10," he says. "I had a teacher who spent an afternoon on cryptography. I went home and had my father get me all the books out of the college library on the subject."

By 1973, Diffie was a research assistant who annoyed his artificial intelligence professors at Stanford by putting all his time and energy into cryptography. After he had finally pushed his AI instructor too far, Diffie took a leave of absence and traveled the East and West coasts in his VW bug, interviewing cryptography experts and digging up rare manuscripts.

Public Key, *page 94*

Public Key Mystery

CONTINUED FROM PAGE 93

Meanwhile, Ralph Merkle, an obsessively clean-cut electrical engineering student at the University of California at Berkeley, wandered the campus consumed by cryptography.

"I had thought about how to provide secure communications between a terminal and a computer," says 6-foot-3-inch Merkle, who wears a cryonics bracelet on his right wrist, in his cluttered office at Xerox Corp.'s Palo Alto Research Center. "I realized that if both the terminal and the computer had random numbers, it wasn't impossible to reestablish keys over an open communications line."

While piecing together ideas on data encryption, Hellman continued to search for kindred spirits. Instead, Diffie found him — in September 1973. What started as a half-hour meeting ended as dinner for four at the Hellmans' house, with both couples talking until nearly midnight.

Hellman and Diffie began to work on a way to secure buying and selling from a home terminal. "I began thinking about how you could receive a message and transform it in a way that nobody else could achieve but that other people could recognize," Diffie says. "Then I realized you could create a message that only one person could read through credentials and a signature."

Hellman and Diffie submitted their first paper on the theory of digital certificates and signatures in December 1975. It was presented six months later at the National Computer Conference in New York.

Although it remains invisible to the end user, public key uses public and private keys to encrypt and decrypt messages, along with digital signatures and certificates to verify the sender's authenticity. It's loosely based on complex mathematical factoring.

Over at Berkeley in 1975, Merkle had formed the problem of secure communication independent of signature and certificate. He was attacking the distribution of the public key based on random numeric puzzles as his premise. When he read the Hellman-Diffie paper, Merkle looked up Hellman, who talked Merkle into switching his graduate work to Stanford.

In 1976, Hellman and Diffie helped solve Merkle's problem of public-key distribution and added digital signature. They produced and patented a system called the Diffie-Hellman. Their discovery launched the three into an intense orbit of media attention.

But the attention died as quickly as it was born. The inventors were ahead of their time: There wasn't yet a problem that needed their solution.

Fast-forward to 1996. Nostalgia for the '70s rages in a tongue-in-cheek way. And thanks to the explosion of the Internet, public-key cryptography has come of age. It's ballyhooed as the facilitator of online commerce and banking. It's buried in nearly every Internet, intranet and client/server transactional application: electronic banking, data warehousing, faxes, electronic mail, World Wide Web browsers, wireless telephones and routers.

Takin' care of business

"Public key is being used from the financial services sector to network carriers, [Internet service providers], phone companies, high-tech companies — just about any client/server environment," says David Morris, vice president at Cylink Corp. in Sunnyvale, Calif. Cylink uses Diffie-Hellman extensively, and licenses the technology to, among others, Motorola, Inc., Microsoft Corp. and Netscape Communications Corp., Morris says.

Stanford University News Service

Merkle, Hellman and Diffie. This photo ran in *Time* magazine in 1978 as part of a publicity whirlwind. But public key was ahead of its time, and the furor rapidly petered out.

Stephen Cobb, director of special projects at the National Computer Security Association in Carlisle, Pa., and an author on network security, stresses that no cryptography is perfect. But he says of public key: "At this point, we can't see a way of beating these systems without applying a lot of time and technology."

As an industry, the worldwide information security market last year reached $5.9 billion. It's expected to swell to $13.1 billion by 2000, according to Dataquest in San Jose, Calif.

The networking world is finally recognizing the contribution made by Diffie, Hellman and Merkle. The three were honored in June at a Cylink-sponsored awards ceremony in Burlingame, Calif.

Public key works. Lots of big companies make lots of big money off it. So the question remains: Why aren't Hellman, Diffie and Merkle rich?

These days, Merkle is still working on long-term inventions in the field of nanotechnology for Xerox. Hellman is in semiretirement as a professor emeritus at Stanford and has taken to flying glider planes. Diffie is an engineer at Sun Microsystems, Inc. in Palo Alto.

Hellman and Merkle have yet to see any real money from the patent. Diffie took some stock with Redwood City, Calif.-based RSA Data Security, Inc., which uses Diffie-Hellman in some of its technologies. To date, Stanford's Office of Technology Licensing has received only $70,560 from Cylink and has distributed about $10,000 apiece to Merkle, Hellman and Diffie.

And the inventors? To a man, they roll their eyes and shrug eloquently. They've been ordered not to talk about the case by attorneys because of pending patent litigation.

A long road

"The inventors are frustrated and rightly so. It's been a long, frustrating experience," says Joe Koepnick, senior licensing associate at Stanford's Office of Technology Licensing.

Neither Stanford nor Cylink will divulge the details of their agreement for patent rights. An audit last year at Cylink found no mismanagement on Cylink's part, Koepnick says.

One thing is certain: In any discussion of the case, RSA — Cylink's chief competitor — is mentioned frequently. RSA was recently acquired by Cambridge, Mass.-based Securities Dynamics Technologies, Inc.

Cylink and RSA formed a joint patent entity in 1990 and called it Public Key Partners. RSA developed an application algorithm for the Diffie-Hellman technology. The relationship, and Public Key Partners, dissolved in 1994. There are now two lawsuits pending. Each side accuses the other of patent infringement and invalidity. The overriding question is whether algorithms can be patented at all.

"It's quite a soap opera," says Bob Fougner, general counsel for Cylink. "RSA is attempting to invalidate the Stanford patents, and Cylink is now challenging the validity of the RSA patent. Our contention is that [Ron] Rivest [an inventor and one of RSA's founders] did not make a fair disclosure at the patent office about all the help he got from Marty Hellman that led to Rivest's specific algorithm."

RSA president Jim Bidzos contends that all RSA did was aggressively market the technology, which he says Stanford and Cylink dropped the ball on. "RSA led the way in developing the technology and getting it out to the vendor community. We built on the best invention, marketed it and I personally spent 11 years on this," Bidzos says. "We've paid millions of dollars to MIT, much of which goes back to the investors. In the case of Stanford, Cylink has paid peanuts."

The Diffie-Hellman patent will expire in April 1997.

So why aren't Hellman, Diffie and Merkle rich?

The intrigue, charges and countercharges do little to answer the question. Whatever the outcome, though, the principals seem sanguine. A little older, more philosophical and a tad more jaded, Doctors Hellman, Diffie and Merkle personify what Hellman calls "the Stanford mentality." He says, "Stanford is a type of academia cult in which reputation is more important than making money." ■

Kerr is a freelance writer in northern California. She specializes in Internet commerce and related security issues. Her E-mail address is dkerr@aol.com.

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View *from the* TOP

A veteran SAP consultant reflects on his experiences, and prospects, with the industry's hottest skill.

BY LESLIE GOFF

Sukumar Narayanan, 34

Title: *Principal consultant, Price Waterhouse, Philadelphia*

Current client: *A Fortune 500 specialty chemical company based in Philadelphia, January 1996 to present*

Background: *IS consultant, 11 years; SAP consultant, five years; joined Price Waterhouse in January 1990*

An independent consultant with SAP expertise can work just about year-round and command a top hourly rate. Yet some information systems professionals prefer to stay within a structured environment rather than strike out on their own.

Sukumar Narayanan, 34, a principal consultant at Price Waterhouse LLP in Philadelphia, recently spoke with *Computerworld* about how he gained his experience in SAP AG applications, why he has steadfastly remained within the corporate fold and what the money potential *really* is.

CW: Describe your current project and your role in it.

NARAYANAN: I'm project manager for a worldwide SAP implementation. I'm responsible for about 25 to 30 people — a mix of internal staff and external consultants. This is my first full-scale project management role.

CW: Why were you chosen for this role?

NARAYANAN: I had been in charge of pieces of a project, like the supply chain, so I had project leader and implementation experience. I had worked for another chemical industry client, a consumer products client and a high-tech client.

CW: How did you come by your SAP expertise?

NARAYANAN: Price Waterhouse asked me to become a SAP consultant because I had the right mix of technical and business skills. My prior experience was in custom development work focused on the supply chain, from inventory management to order fulfillment.

They first asked me about a year before I agreed to make the switch. My initial concern was that I didn't want to tie my future to this one package. But as I started to think more about it, I realized a lot of custom work was being done in niche applications developed around other packages. Very few companies were doing custom apps from scratch anymore because they just weren't cost-effective.

So, the way my career was progressing, I started to think of myself as a supply-chain business consultant first and my technical skills as a value-added that I brought to the table. Using my business skills as a base, I could constantly refresh my career in new technologies. So I trained in R/2 and, later, R/3.

CW: How has becoming an SAP consultant changed your playing field?

NARAYANAN: Making the move from custom development to SAP has definitely enhanced my employability and my professional development, simply because of the market demand. I don't think I would have gotten the roles I've had, such as becoming a project leader, in a more mature market.

CW: With all the hype about contract SAP salaries, why have you chosen to work for a large consulting house?

NARAYANAN: As an independent consultant, you can probably command close to $500,000 a year. That's if you were busy 200 days on a large project. But working for a company like this — although the income potential isn't quite as high — if there's a downturn in the SAP market, Price Waterhouse will retool me so I can play in a new market.

Also, as an independent consultant, you typically sell yourself as an expert, so you don't get to manage a large implementation project. Usually, there's a functional area that you are focused on, and it's really just your SAP expertise that you're sought after for.

The way I view it, I could cash in for a short period of time on my own and then maybe come back to a more stable environment, or I could just go out and be a free agent for the rest of my career.

CW: What advantages are there to being with a consulting firm?

NARAYANAN: I was attracted to Price Waterhouse in the first place because of the atmosphere, the level of commitment. There's really a partnership between the company and its consultants. They've invested a lot in me. Plus, here I'm engaged in developing and improving our methodology and working on other internal projects, like mentoring and developing other Price Waterhouse professionals.

When I think of [independent consulting] opportunities, I think, "Yeah, it might be 50% more money, but would it be the same working environment?" I've built strong relationships with people here. If I continue to progress the way I have, I'll be a long-term player in this firm, so I will do well financially in that respect. But it's a given that in the short term I won't make as much as if I were in the open market.

CW: What's your take on the current level of demand for SAP expertise?

NARAYANAN: I think the demand may be leveling off a bit, gauging from calls that I get from recruiters, but it's still very high. But it tends to come in waves. Sometimes it's quiet; other times I'll get two calls a week from various recruiters around the country.

There is still a lot of opportunity out there. SAP is saturating the Fortune 500, but it's getting ready to move into smaller markets. Plus, there's hidden demand in companies that have been sitting on the fence or are going to have to deal with year 2000 problems.

CW: What are your future plans?

NARAYANAN: In the short term, my focus is on getting my current client up and running and successful by the late fall. After that, Price Waterhouse and I will determine the next best thing for me to do. I guess I'll move on to managing another, perhaps larger, project — another large global implementation. And perhaps I'll take on some other responsibilities. ■

Goff is a freelance writer in New York.

"I live on the edge, but I don't risk my career."

Dana Wilson, Functional Consultant

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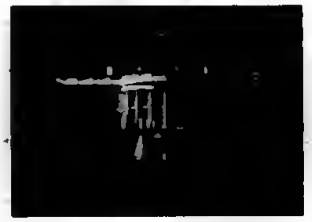

Capital callings

Bureaucracy, of course. But Washington's other hiring hotbed is in the Internet and communications.

By Rosemary Cafasso

If you're thinking that an information systems career in the Washington area would automatically lead to a government job, think again. Sure, government agencies are hanging out the help wanted sign. But the region also has become a hotbed of Internet and communications activity.

"It seems like just [recently] everyone wanted to get on the 'net, and now everyone wants an intranet," says John Gay, chief information officer at the Fairfax County (Va.) public schools and president of the Capital Area chapter of the Society for Information Management. "Every skill from [World Wide] Web management to Web software development is in demand."

The greater Washington area is home to companies such as MCI Communications Corp., America Online, Inc. and UUnet Technologies, Inc., and IS executives in the public and private sectors say they are on the prowl for people with Web and general networking skills.

No limits

"The difference with Washington is that the government, by law and design, dictates that there be the broadest range of hardware and software environments," says Carol Covin, author of *Covin's Washington Area Computer Job Guide* and director of business development at Xybernaut Corp. in Fairfax, Va.

"So, for an IS professional, you can find a flavor of anything — intranets, internets, Java, [electronic data interchange] — all the things that are hot," Covin says. Besides Web experience, IS managers and recruiters say related skills, such as graphics, multimedia, imaging and document management, are increasingly important.

And the focus on the Internet has made networking skills such as administration and management all the more crucial. American University, for example, is looking for network administrators and troubleshooters, says Joyce Deroy, acting executive director of university computing.

Even though there are more opportunities in the private sector, federal agencies are still hiring — albeit at a slow pace. The Library of Congress, for example, has a major Internet project under way and is looking for talent in Web development. Its Web site (www.loc.gov) is essentially the front end to a massive project under way to transfer the library's materials to an online format.

"We want people who know the Web and browser technology and the architecture for storing a great deal of digital information — and we are talking millions of items," says Herbert Becker, director of information technology services at the Library of Congress.

The American Red Cross is another example. The organization may be well over 100 years old, but it is focusing on the most current technologies to run its operations. One of the key initiatives is its Web site (www.redcross.org), which is being used to post information on disasters and blood requirements and volunteer and chapter information.

Beyond the Internet, other skills in demand are client/server expertise, including software development. Based on interviews with several IS shops, there is limited interest in mainframe skills.

Steven Yohai, CIO at the Department of Housing and Urban Development, says he occasionally needs to hire mainframers with operations backgrounds to help run the data center because "that technology has not gone away." But he isn't actively recruiting for any major new mainframe development initiatives.

But at least one recruiter predicts that mainframe skills will soon become a much hotter commodity as year 2000 reprogramming efforts become a top priority. ■

Cafasso is a freelance writer in Walpole, Mass.

Capital career

There are more than 4 million workers in the Washington region. Of that group, 16.7% are employed by the federal government, according to the Washington D.C. Convention and Visitors Association.

• For general information on Washington, try logging on to **www.washington.org** on the Web. It provides tourist information, a guide to hotels and restaurants and general city information.

• **Wanted: CIOs.** As part of the 1996 Information Technology Management Reform Act, nearly two dozen federal agencies are required to appoint a chief information officer. But according to a *Computerworld* story in July, not all agencies were expected to meet the August deadline because it is so difficult to find qualified candidates who are willing to take on these tough assignments. And these government CIOs would be paid about $115,600 a year – much less than they could likely command in the private sector.

Salaries
STARTING PAY

Sample paychecks for IS professionals in Washington:

Entry-level computer programmer	$674 per week
Entry-level computer systems analyst	$737 per week
Entry-level systems analyst supervisor	$1,174 per week

Source: Bureau of Labor Statistics

Unemployment
WORK ETHICS

Unemployment rates in the capital region:

Washington region	3.8% (as of May)
District of Columbia	8.7% (as of May)
U.S. average	5.3% (as of June)

Source: Bureau of Labor Statistics

Top employers
POWER PLAYERS

The region's Top 5 public companies represent a range of industries:

Company and location	1995 revenues	Employees
Mobil Corp., Fairfax, Va.	$71.8 billion	50,400
Lockheed Martin Corp., Bethesda, Md.	$22.8 billion	160,000
MCI Communications Corp., Washington	$15.3 billion	50,987
Marriott International, Inc., Bethesda, Md.	$8.9 billion	179,400
US Air, Arlington, Va.	$7.4 billion	42,982

The Top 5 performers by revenue growth are dominated by Internet and communications companies:

Company and location	1995 revenues	change from 1994
America Online Inc., Vienna, Va.	$394.3 million	240.8%
UUnet Technologies, Inc., Fairfax, Va.	$94.5 million	185.1%
Storage USA, Inc., Columbia, Md.	$88 million	163.2%
PSINet, Inc., Herndon, Va.	$38.7 million	154.5%
Metrocall, Inc., Alexandria, Va.	$110.9 million	91.5%

Source: *The Washington Post*, special issue, The Post 200, April 1996

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DATABASE ADMINISTRATOR

Responsible for providing production database administration for ORACLE 7 databases in a UNIX environment. Perform ORACLE installation, performance tuning, backup and recovery, and user administration. Provide implementation support to the IS development staff for client/server applications including: schematic configuration control, database security, SQL tuning, and database standard enforcement. **REQUIRES:** BSCS or related technical degree and a strong technical background of: 3+ years ORACLE database administration and 2+ years UNIX experience; proficiency with Windows 3.1/NT and TCP/IP PowerBuilder, ORACLE Designer 2000, BMC Patrol, Novell Netware, or distributed database skills a plus.

DATA ADMINISTRATOR

Responsible for providing data analysis expertise to IS development teams in the areas of definition, development, and deployment of global data assets. Participate in the design process, define business process flows, entity relationship diagrams, and database objects, and provide data modeling support to IS development staff. This includes creation of business data models, maintenance of a CASE repository, QA review, and standards definition. **REQUIRES:** BS degree in a relevant technical discipline, along with a strong technical background which will include: 6+ years full life cycle design and development, 4+ years data administration 3+ years with CASE tools, and superior communication skills. Experience with client/server applications, PowerBuilder, ORACLE Designer 2000 is a plus.

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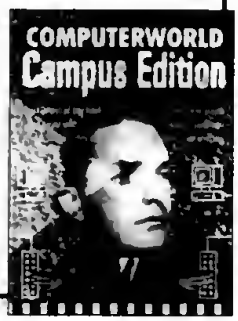

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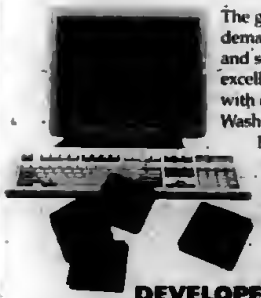

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This position is responsible for designing and implementing an enterprise-wide data model utilizing CASE (Computer-Aided Software Engineering) tools and repositories as appropriate. In addition, you will provide data modeling consulting services to application development teams, and formulate, administer and execute company policy regarding accuracy, integrity, reliability, accessibility and security of corporate data, some of which is confidential and sensitive.

Qualifications include a BS/BA in Computer Science, Information Engineering, Information Management, MIS or Math with courses in Data Modeling or Information Architecture. A Master's degree with an emphasis in Information Engineering is preferred. In addition, four years experience in data administration, database administration or computer application systems development as an analyst or project leader is required. Excellent communication, presentation and interpersonal skills are essential.

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SOFTWARE ENGINEER to design and develop Windows simulation applications and video scoring software in PC and UNIX-like operating systems involving real-time software development, video image processing, interprocess communication in real-time operating system, and MS-Windows packages design using MS Visual C/C++, algorithm design, database design, real-time processing, and graphics simulation. Require: Master's degree in Computer Science, Electrical Engineering, Applied Mathematics, or a closely related field with a demonstrated ability to perform the stated duties gained from prior experience/academic coursework. Graduate coursework must include one semester/quarter long course each in computer architecture, operating systems, computer algorithm image processing and linear algebra. Salary $47,500 per year 8 am to 6 pm, M-F. Send resume to Jim Hall, Firearms Training Systems, Inc., 7340 McGinnis Ferry Rd., Suwanee GA 30174. Attn: Dept YW.

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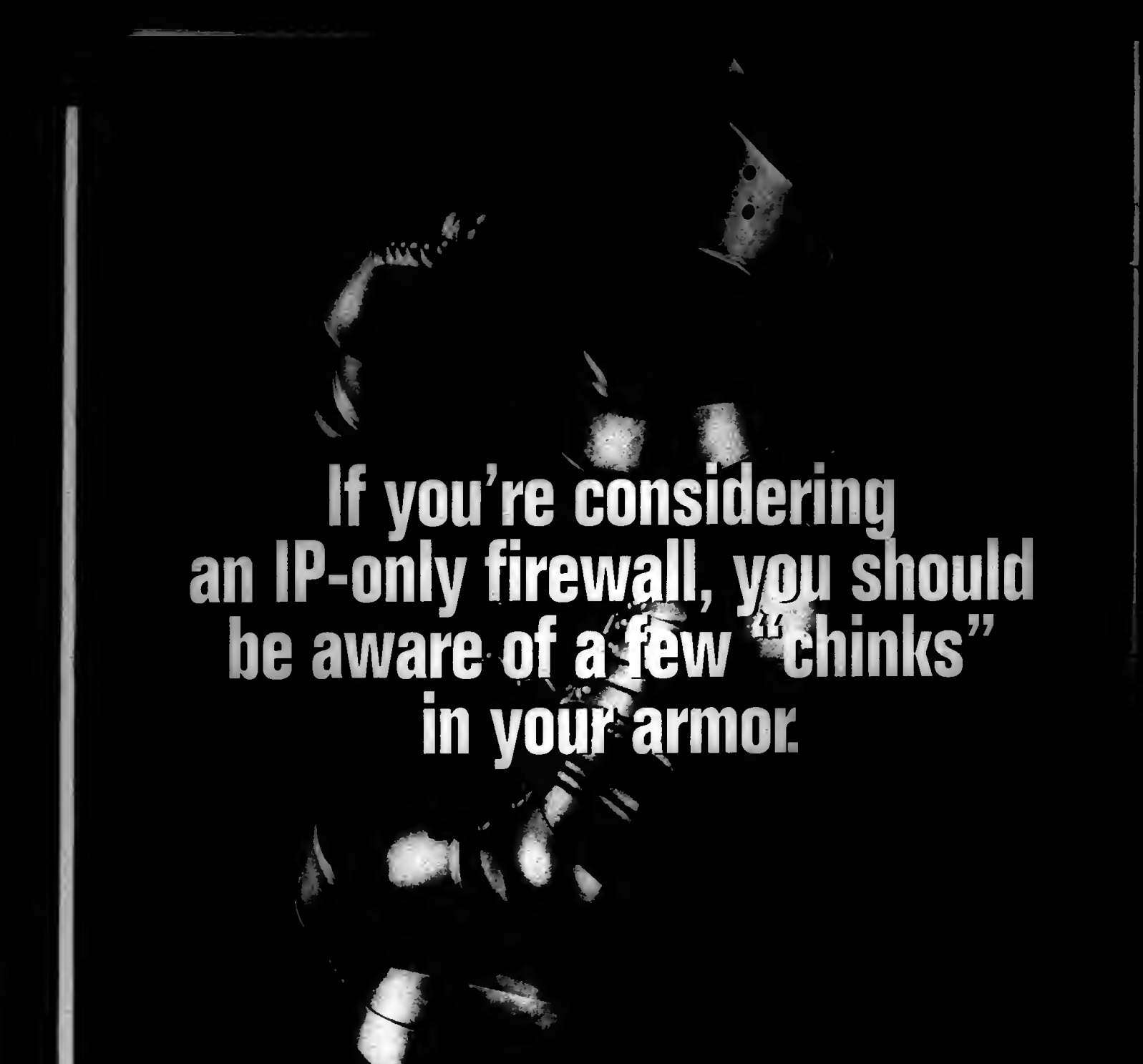

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Marketplace

Windows 95 utilities market dwindling

By Stewart S. Miller

The release of Windows 95 last year signaled a shift in the utilities market. By continuing to pack utilities into the operating system, Microsoft Corp. may send the add-on utilities market into obsolescence with future releases of Windows 95.

"The direction of Windows 95 is to absorb as many utilities as makes sense. That's easy for Microsoft to do, and it makes the operating system more usable and easier for the average user," says Scott Winkler, an analyst at Gartner Group, Inc. in Stamford, Conn.

Web site freebies

Windows 95 already has absorbed the backup and uninstaller utility categories. Also, viewers and converter programs can be downloaded for free from Microsoft's World Wide Web site.

For instance, the site offers Internet Assistant for Word, which makes viewing and writing Hypertext Markup Language documents as easy as editing a word processing document, without any additional cost. Even users who don't own Microsoft Word can view Word documents by using a free utility called Microsoft Word Viewer, which converts Word files into a viewable format.

Such free utilities prompt the question, "Why buy the cow when I can get the milk for free?" The advent of Windows 95 means it isn't cost-effective to purchase a separate product, and so the market for most utility categories is shrinking. As Windows 95 moves to absorb those utilities into its operating system, vendors with tiny market shares will founder.

But diagnostic utilities and virus scanners are two categories that show continued growth. The utilities that remain in demand are those that keep systems free of errors and problems that can cause crashes.

> "The direction of Windows 95 is to absorb as many utilities as makes sense."
>
> *—Scott Winkler, Gartner Group*

One way to accomplish that is to inoculate your system against damaging viruses that can make your computer ill.

Computer antibiotics

One of the biggest dangers users face is losing data to a virus. Windows 95 doesn't have a virus checker, so a virus disinfectant is necessary. And because new viruses are always spreading, it's important to purchase a product that can be updated to detect them.

Symantec Corp.'s Norton AntiVirus (about $75) and McAfee Associates, Inc.'s VirusScan (about $50) each can detect and remove more than 7,500 viruses. Each product is supported by its manufacturer to keep up-to-date with known infections.

TouchStone Software Corp.'s PC-cillin 95 (about $50) can detect and remove more than 6,000 viruses. Users need to configure the program to scan Microsoft Word templates, document files and macros for viruses.

PC checkups

Utilities to monitor and save your computer from file errors and crashes include Symantec's Norton Utilities for Windows 95 (about $129, or $70 to upgrade) and First Aid 95 from CyberMedia, Inc. (about $50).

Symantec's offering is the dominant product.

"Norton Utilities owns the majority of the market — around 80%," says Rob Enderle, an analyst at Giga Information Group in Santa Clara, Calif. The remainder of the market belongs to utility vendors such as CyberMedia, McAfee and TouchStone.

CyberMedia's First Aid can clean out duplicate instructions that occur within the registry when applications tools or desktop attributes are changed. It also examines the settings each time an application is started; it goes through every application and sees which settings need adjustment and fine-tunes the PC.

"First Aid 95 is selling on the perceived weaknesses of Windows 95; it creates the feeling of a security blanket," Enderle says.

First Aid's CyberFix feature offers a wizard that uses your Internet connection to retrieve from Microsoft's Web site the most recent Windows 95 update. First Aid's Retro-Fix feature allows you to repair any difficulties that arise from installing hardware or applications.

Symantec's Norton Utilities offers an array of heavily armed utilities to keep track of disk activity and system usage. Norton Speed Disk fixes disk fragmentation, which can occur after multiple application installations and deletions. Norton Disk Doctor keeps a system in full working order by detecting disk errors and providing the ability to fix them. Norton System Doctor scans a disk surface for errors and keeps critical disk information backed up for a quick rescue should it ever be lost.

Although simple diagnostic utilities in Windows 95 can scan for errors, it's unlikely that third-party utilities that diagnose problems and hunt down viruses will be phased out because of future releases of Windows 95. ■

Miller is a writer at Executive Information Services in Carlsbad, Calif.

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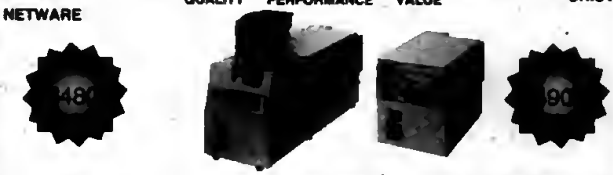

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Cashing in on Year 2000

Reprogramming work, consulting jobs may spell rising stocks for some vendors

By Stewart Deck

"Two-thousand-zero-zero
Party over
Oops, out of time.
Tonight we're gonna party like it's 1999."
— From "1999" by the artist formerly known as Prince

Three years, three months and counting until "Oops, out of time" could crop up in mainframe legacy systems.

As the two-digit date fields spin closer toward twin goose eggs, the Year 2000 issue has even caught the attention of Congress and the general business press — they are starting to notice the nice round $200 billion to $500 billion price tag to fix this mother of all data problems.

Fortune magazine recently published a story about it in relation to a Wall Street feeding frenzy for Year 2000-related stocks. The article was spiced with rumors of newsletter tips, inside information and healthy profits that early investors could rake in.

Gold mine

Despite the legitimate concerns of corporate information systems groups about the Cobol code on their mainframes, many companies are rubbing their hands with glee and viewing the Year 2000 issue as a potential gold mine. These firms will be the ones that provide the specific expertise needed to fix each of the estimated 250 billion lines of code.

Several of these vendors have been involved in consulting roles, code maintenance services and software fixes for years. Others have plowed into this money-making space more recently, touting their tools and newfound status as Year 2000 "solutions providers."

One company that many analysts mention as a solid Year 2000 play is **Viasoft, Inc. (Nasdaq:VIAS)**. *Fortune* dubbed Viasoft "one of the strongest of the Year 2000 stocks." Wendell Laidley, an analyst at Wessells, Arnold and Henderson LLC in Minneapolis, says Viasoft has combined its "long-standing expertise in Cobol maintenance" with a lengthy customer list to earn approximately 35% of its most recent reveoue from Year 2000 fixes.

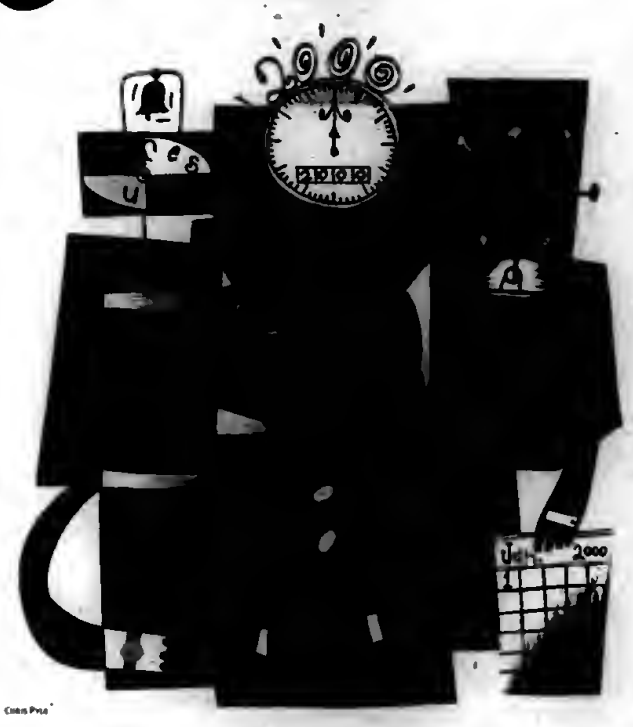
"Viasoft is seen by some investors as *the* company with Year 2000 solutions" because it can go directly to the source of the problem: the lines of Cobol code, says David Takata, an analyst at Gruntal & Co. in Beverly Hills, Calif.

Other software vendors have positioned themselves to benefit from the turn-of-the-century uproar. Many of these tools were designed to sniff out potential date field problems and point out where code needs to be fixed.

> "I'm sure some of the direct-play stocks will do fine for a couple of years, but this problem could well be solved quickly."
>
> **– Michael Murphy "California Technology Stock Letter"**

These companies include **Platinum Technology, Inc. (Nasdaq:PLAT), Micro Focus Group (Nasdaq:MIGFY), Computer Associates International, Inc. (NYSE:CA)** and **Cayenne Software, Inc. (Nasdaq:CAYN)**. Laidley says some of the companies in this sector are merely "low-level players" looking to cash in with recently converted tool sets. Interested investors will need to do research to discover the difference between the companies with foundation knowledge and those with shiny new tools, Laidley adds.

These software stocks are just one of the Year 2000 investmeot categories in an investment report by Willism Rabin at J. P. Morgan Securities, Inc. in New York. Rabin says several small to midsize consulting firms and large systems integrators also will benefit from Year 2000 problems. Rabin's full report is available at www.jpmorgan.com/MarketDataInd/Research/Year2000/index.html.



Chris Price

The consulting companies most likely to benefit — by placing their staff within corporate information technology departments — include **Computer Horizons Corp. (Nasdaq:CHRZ), Amdahl Corp. (Amex:AMH), Keane, Inc. (Amex:KEA)** and **Data Dimensions, Inc. (Nasdaq:DDIM)**. Many of these companies simply send a team of programmers in to search for and fix lines of code.

Amdahl recently entered the Year 2000 game by purchasing Trecom Business Systems, another consultancy with program troubleshooters. Keane and Data Dimensioos also provide contract programmers that work with specific methodologies to ferret out those pesky date fields and adjust them to handle four digits instead of two.

If the problem looks too big to be handled by contractors, large systems integrators, including **Electronic Data Systems Corp. (NYSE:EDS), Computer Sciences Corp. (NYSE:CSC)** and **American Management Systems, Inc. (Nasdaq:AMSY)** will be called in for major remodeling work, according to Rabin's report.

Other analysts have a different view of how much of a windfall the Year 2000 problem will really prove for investors. Michael Murphy, a financial analyst and editor of "The California Technology Stock Letter" in Half Moon Bay, Calif., says investing in companies that offer direct Year 2000 fixes is a bit shortsighted.

"I'm sure some of the direct-play stocks will do fine for a couple of years," Murphy explains, "but this problem could well be solved quickly" and strand investors trying to play the momentum of the market.

Getting relational

Instead of just trying to fix lines of Cobol code, many companies may decide the time has finally come to convert their Cobol databases to relational databases, Murphy says. Since many companies are already considering the switch, they may decide to sidestep the Year 2000 problem by switching over to relational database vendors such as **Oracle Corp. (Nasdaq:ORCL), Informix Corp. (Nasdaq:IFMX), Sybase, Inc. (Nasdaq:SYBS)** and even **IBM (NYSE:IBM)**.

Whatever advice you take, keep in mind that the Year 2000 problem won't drag on indefinitely. Vendors are starting to compete for the largest contracts, and their cash registers are starting to ring. Wall Street analysts say the earlier investors do their research and make their choices, the more they'll look forward to 2000.

The Week in Stocks

Gainers

PERCENT

Stock Corp.	33.3
Computer System Corp.	30.8
Network Computing Devices	17.9
Software Publishing Inc.	16.0
Zytec Inc.	15.6
Amazing Int'l	15.2
Job Alliance	14.3
Remington Products Corp.	13.0

DOLLAR

Stock Inc.	6.25
Array Software	4.88
Peripherals Corp.	4.38
Intel Inc.	4.25
Int'l Industries	4.38
Int'l Stock	3.88
Stock Corp.	3.13
Remington Products Corp.	3.00

Losers

PERCENT

Alloy Inc.	39.7
Micro Int'l	33.3
Array Software	16.0
Intel Inc.	14.8
Number Corp.	12.5
Data Systems	11.8
Remington Products Corp.	11.5
Computer Systems Inc.	10.0

DOLLAR

Alloy Inc.	6.25
Array Software	4.88
Peripherals Corp.	4.38
Intel Inc.	4.25
Int'l Industries	4.38
Intel Inc.	3.88
Stock Corp.	3.13
Remington Products Corp.	3.00

Industry Almanac

Investors aren't dialing up

Confronted by the entrance of several telecommunications giants into their market, Internet service providers are trying to hold on to their turf. In the meantime, investors are doing little more than holding on to their shares.

Pure Internet access firms such as **Netcom On-Line Communications Services (Nasdaq:NCOM)** and **PSINet (Nasdaq:PSIX)** now face competition from telecommunications giants such as **AT&T Corp. (NYSE:T), MCI Communications Corp. (Nasdaq:MCIC), Sprint Corp. (NYSE:FON)** and a slew of regional Bell operating companies. Or, like UUnet Technologies, Inc., they are being bought up.

That means things have remained relatively stagnant for these Internet-related stocks, even with recent deals and continued growth of the Internet access market. The experience of pioneering service provider Netcom is typical, despite an agreement that boosts its profile.

Netcom recently inked a deal by which **Microsoft Corp. (Nasdaq:MSFT)** would refer Internet access business exclusively to the San Jose, Calif., firm.

But Netcom still focuses too much on consumer accounts, where competition is at its fiercest, without expanding its commercial business, says Rakesh Sood, an analyst at San Francisco brokerage Hambrecht & Quist. Sood has a "hold" rating on Netcom shares.

Netcom's commercial business has ranged from 15% to 20% of sales. To boost that percentage and gain business interest, Netcom has to risk some of its minimal margins to upgrade its network to offer full Integrated Services Digital Network access speeds, Sood says.

"In the absence of additional revenue streams or an inability to raise subscription rates, Netcom is going to be forced to live with a clamped-down revenue stream," and stock performance will continue to flounder as a result, Sood predicts.

— Tim Ouellette

Squeeze play

Heavy competition has depleted Internet access profits and deflated stocks that are pure plays in this area

	June 21	July 12	Aug. 30	Sept. 3	52-week high
America Online	40	37⅝	30½	29⅝	71
IBM	22	18⅛	18⅛	18⅛	48⅛
Netcom	39½	22	19⅛	19	91½
PSINet	13⅞	9½	10⅛	10⅛	29

Stock	52-Week Range			Sept. 6 Stock Price	Wk Net Change	Wk Pct Change
COMS	51.63	33.50	3Com Corp	47.63	0.38	0.8
ATT	66.88	49.88	Ameritech Corp	50.50	-0.50	-1.0
T	66.88	50.25	AT&T	52.63	0.50	0.7
ASND	71.25	15.50	Ascend Communications	53.75	1.00	1.9
BNYM	13.63	5.38	Banyan Systems Inc.	5.75	0.13	2.2
BAY	50.00	20.25	Bay Networks Inc.	26.50	-0.50	-1.8
BEL	54.38	43.50	Bell Atlantic Corp.	45.63	-0.50	-0.9
BLS	45.88	33.88	BellSouth Corp.	38.13	-0.38	-1.0
BRKT	32.75	6.88	Brooktrout Technology	26.00	1.00	4.0
CS	67.25	53.00	Cabletron Systems	57.38	-3.13	-5.2
CSCC	74.75	14.00	Cascade Communications	68.63	0.88	0.8
CGRNA	25.13	12.75	Centigram Communications	16.13	-0.88	-5.1
CSCO	59.50	50.50	Cisco Systems Inc.	54.00	0.00	1.6
CLIX	9.75	4.50	Compression Labs Inc.	6.00	-0.38	-5.9
CMNT	10.50	6.00	Computer Network Tech.	5.88	-0.13	-2.2
XCOM	14.50	8.00	CrossComm	9.50	-0.75	-2.6
DIGI	64.00	21.88	DSC Communications	50.81	-0.88	-1.9
FORE	64.75	13.88	FORE Systems Inc.	32.38	-2.63	-7.5
GDC	71.88	9.13	General Datacomm Indus.	11.00	0.13	1.1
GSX	42.00	28.00	General Signal Networks	41.13	1.25	3.1
GTE	50.25	38.50	GTE Corp	38.50	-1.50	-3.5
LU	50.25	29.75	Lucent Tech.	37.13	0.13	0.3
MCIC	32.13	22.00	MCI Communications Corp	25.75	0.75	1.0
MMPI	34.50	5.50	Micrognon Inc.	9.25	0.75	8.8
NETM	34.00	7.63	NetManage Inc.	8.06	-0.88	-9.8
NTBX	50.88	1.63	Netbix Corp	7.88	1.38	21.2
NCDI	50.25	1.88	Network Computing Devices	5.75	0.88	17.9
NWK	42.00	11.50	Network Equipment Tech.	12.00	-0.75	-5.8
NETG	27.63	15.00	Network General	18.63	-0.75	-4.3
NRI	79.75	25.00	Newbridge Networks Corp.	64.00	-6.38	-11.3
NT	55.88	31.38	Northern Telecom Ltd.	50.13	0.00	0.0
NOVL	50.63	30.13	Novell Inc.	30.75	0.00	0.0
NYN	59.21	42.50	Nynex Corp (L)	42.63	-0.75	-0.6
OCTL	30.50	12.63	Octel Communications Corp	10.88	-1.00	-3.5
ODSI	52.25	16.38	Optical Data Systems Inc.	30.38	0.75	3.9
PAC	95.25	35.88	Pacific Telesis	32.88	-0.13	-0.8
PCTL	64.72	38.75	Picturetel Corp.	32.00	-0.88	-2.7
PTON	30.75	2.88	Proteon Inc.	2.88	0.13	4.5
RACO	7.63	1.50	Racotek Inc.	4.00	0.38	10.3
RETX	50.88	1.81	Retix	4.50	0.50	6.3
SBC	58.00	46.88	SBC Communications (L)	46.50	0.00	0.0
SFA	31.13	11.88	Scientific Atlanta Inc.	12.50	-1.00	-7.4
SHVA	87.25	21.13	Shiva Corp.	30.75	-0.25	-0.5
FON	45.50	29.25	Sprint Corp.	38.88	-1.63	-4.0
SMSC	23.38	10.25	Standard Microsystems Corp.	13.44	0.56	4.4
TBIT	13.88	3.50	Telebit Corp.	13.13	0.13	1.0
USRX	105.50	32.75	US Robotics	50.38	-4.50	-8.2
USW	58.38	27.88	US West Inc.	37.88	-1.50	-3.8
XIRC	17.88	8.88	Xircom	13.63	-0.25	-1.8
XYLN	76.00	34.00	Xylan Corp.	42.25	0.00	0.0
AALR	10.50	5.88	Advanced Logic Research	7.88	-0.50	-6.5
AAPL	45.50	14.00	Apple Computer Inc.	22.94	-1.44	-5.9
ASTA	13.75	4.38	AST Research Inc.	5.00	-0.25	-4.8
CPQ	58.13	35.00	Compaq Computer Corp.	47.38	1.13	2.0
DELL	38.75	23.00	Dell Computer Corp. (H)	38.88	1.38	2.0
GATE	45.38	18.00	Gateway 2000 Inc. (H)	42.13	-2.88	-6.4
HWP	57.75	50.88	Hewlett Packard Co.	43.63	-0.50	-0.9
IBKD	29.88	9.75	Micron International Inc.	15.31	-0.88	-4.3
NSMY	75.19	50.88	NEC America	53.25	-0.50	-0.9
SGI	42.88	30.00	Silicon Graphics	23.88	0.00	0.0
SUNW	67.13	26.38	Sun Microsystems Inc.	54.00	-0.76	-1.0
AMH	13.38	6.75	Amdahl Corp	9.38	-0.56	-5.7
DGN	10.13	8.88	Data General Corp.	10.63	-0.50	-4.5
DEC	76.50	50.38	Digital Equipment Corp.	56.38	-0.25	-0.6
IBM	178.88	63.13	IBM	138.50	1.13	1.0
MDCD	20.75	7.13	Meridian Data Inc.	6.63	0.00	0.0
NETF	7.25	3.75	NetFrame	3.81	-0.06	-2.2
SQNT	25.50	10.13	Sequent Computer Sys.	11.38	0.50	3.4
SEQS	8.50	1.88	Sequoia Systems Inc.	3.06	-0.19	-8.3
SRA	36.13	18.00	Stratus Computer Inc.	20.00	0.75	3.9
TDM	11.25	9.50	Tandem Computers Inc.	10.63	0.00	0.0
UIS	9.13	5.38	Unisys Corp	6.31	0.25	4.3
ADBE	74.25	38.50	Adobe Systems Inc.	55.88	-1.50	-4.2
AMSWA	8.75	3.63	American Software Inc.	5.00	0.00	0.0
APLX	42.00	8.75	Applix Inc.	37.50	-3.38	-9.1
ARSW	82.75	38.75	Arbor Software	35.00	-6.00	-14.6
AOSK	50.00	18.50	Autodesk Inc.	22.25	-1.00	-4.3
BGSS	50.00	29.75	BGS Systems Inc.	44.63	-0.13	-0.2
BMCS	77.50	32.50	BMC Software Inc. (H)	77.38	2.75	3.7
BOOL	26.75	19.25	Boole and Babbage	24.38	-0.25	-1.0
BORL	31.75	16.06	Borland Int'l Inc.	7.38	-0.19	-2.5
BOBJY	55.50	16.25	Business Objects (L)	36.75	-0.75	-2.0
CAYN	11.88	4.00	Cayenne Software Inc.	4.50	-0.38	-10.0
CYE	27.88	14.13	Cheyenne Software Inc.	18.75	0.00	0.0
CGNE	37.50	8.75	Cognos Inc.	24.00	0.50	2.1
CA	59.00	24.88	Computer Associates	53.21	-0.13	-0.2
CVN	11.50	8.75	Computervision Corp.	8.50	1.38	19.3
CPWR	66.00	25.50	Computware Corp.	43.38	-1.63	-3.6
CSRI	32.00	16.75	Commware Inc.	11.00	0.75	1.7
CSFT	58.13	25.25	Cosoft Corp	10.44	0.94	9.9
DMTI	13.75	5.75	Datawatch Technologies Inc.	9.38	0.75	8.7
FILE	87.00	50.88	Filenet Corp	25.13	0.88	3.6
FRTE	81.75	24.75	FourthSoftware	27.00	-3.63	11.8
DOOD	6.00	3.50	4th Dimension	6.00	0.63	11.6
FTPS	60.63	1.88	FTP Software Inc.	7.50	-0.13	-1.6
GPTA	50.25	3.50	Gupta	4.25	-0.25	-5.6
HUM	50.88	15.00	Humanmarket Comm. Ltd.	19.88	1.00	5.3
HYSW	50.38	9.71	Hyperion Software Corp	13.38	0.38	3.9
IRIC	16.25	10.00	Information Resources	12.75	0.13	1.0
IFMX	36.75	18.88	Informix Corp	24.63	2.13	9.4
INGR	20.13	8.63	Intergraph Corp.	9.88	1.00	11.3
LEAF	12.63	7.88	Interleaf Inc.	7.88	-0.13	-1.7
ISLI	23.13	3.50	Intersolv Inc.	8.00	0.31	4.0
INTU	50.75	31.75	Intuit Inc.	32.50	-4.75	12.8
LGWX	22.25	8.75	Logic Works	9.88	0.38	3.9
MAPS	24.00	7.00	Mapinfo Corp	10.21	-0.63	-5.7
MATH	9.25	4.63	MathSoft	8.75	0.00	0.0
MCAF	65.50	37.63	McAfee Associates	62.88	2.75	4.6
MENT	22.88	10.88	Mentor Graphics	15.25	-0.50	-3.6
MFGY	21.25	8.25	Micro Focus	11.00	-0.13	-1.1
MGRI	19.63	9.19	Micrognosis Inc.	10.71	-0.50	-4.4
MSFT	126.13	79.88	Microsoft Corp	122.00	-0.88	-0.1
ORCL	42.13	23.88	Oracle Corp	37.44	1.56	4.4
PMTC	49.50	35.88	Parametric Technology	42.13	0.63	1.5
PARQ	14.63	4.50	ParcPlace Systems Inc.	6.75	0.00	1.3
PSFT	79.75	33.88	Peoplesoft (H)	71.13	-5.38	-7.0
PTEC	30.38	9.88	Phoenix Technologies	16.63	-0.36	-2.2
PSQL	14.13	3.13	Platinum Software	9.71	0.13	1.3
PLAT	25.75	9.25	Platinum Technology	10.88	-0.13	-1.1
PRGS	38.38	12.13	Progress Software Corp.	16.50	0.38	1.1
RNBO	25.50	10.63	Rainbow Technologies Inc.	13.35	-0.38	-2.1
REDB	61.00	36.25	Red Brick Systems Inc.	38.88	-0.75	-3.6
ROSS	8.13	2.19	Ross Systems	4.88	-0.25	-4.9
SAPE	58.25	39.25	Sapient Corp.	41.50	-1.75	-4.0
SCOC	13.13	5.38	SCO Inc.	7.38	0.31	4.7
SDTI	109.38	19.75	Security Dynamics Tech.	65.75	-0.25	-0.4
SKEY	15.75	13.38	Softkey International Inc.	13.13	1.00	1.8
SPCO	5.13	1.19	Software Publishing Corp (L)	1.50	0.13	9.1
SQAX	39.75	16.00	SQA Inc.	23.75	0.00	0.0
SQTA	19.75	8.63	State of the Art	14.25	-0.75	-5.7
SSW	81.38	40.38	Stylus Software Inc.	54.00	-1.88	-3.8
SDRC	37.50	11.50	Struct. Dynamics Research	24.00	-1.13	-4.5
SYBS	38.75	11.25	Sybase Inc. (L)	13.75	-0.31	-1.9
SYNC	33.25	8.75	Symantec Corp	9.13	-0.63	-6.4
SNPS	46.75	23.00	Synopsys	37.75	-0.75	-0.7
SSAK	30.63	8.25	System Software Assoc.	11.00	0.75	3.3
SYSF	23.25	4.50	Systemsoft Corp. (H)	23.25	1.63	-5.1
TRUV	10.11	4.38	Truevision Corp.	4.88	0.00	0.0
VIEW	17.38	9.63	Viewlogic Systems	13.25	0.31	1.6
VMRK	19.25	5.75	Vmark Software Inc.	7.75	-0.75	-3.1
WALK	12.75	8.75	Walker Interactive Systems	11.19	0.25	3.3
WALL	27.50	13.00	Wall Data Inc.	24.63	-0.11	-0.5
WANG	38.13	14.38	Wang Laboratories Inc.	17.88	0.00	0.0
AMER	71.00	24.38	America On-Line	50.88	1.63	-5.3
BBN	48.75	15.63	BBN Corp.	17.75	-0.63	-3.4
CSRV	35.50	30.75	Comprehensive Corp.	32.88	0.13	1.0
EDFY	55.75	16.25	Edify Corp	24.25	0.75	3.2
LCOS	29.75	5.75	Lycos Inc.	7.75	1.06	11.0
NETC	81.50	16.00	Netcom On-Line	19.88	-1.50	-7.7
NSCP	87.00	33.88	Netscape Comm. Corp	57.50	2.13	6.0
OMRT	42.25	13.75	Open Market Inc. (L)	16.00	0.19	0.9
PSIX	29.88	8.75	PSINet	10.83	-0.25	-2.3
QDEV	50.50	5.83	Quarterdeck Corp	7.63	-0.25	-3.2
RAPT	38.75	15.00	Raptor Systems	16.25	-1.25	-7.1
SCUR	64.50	12.50	Secure Computing Corp	12.00	-1.50	-11.1
SPNG	81.00	12.00	Spyglass Inc.	17.38	1.13	6.7
YHOO	43.00	15.50	Yahoo! Inc.	50.38	1.13	4.8
AMD	35.88	10.25	Advanced Micro Devices	12.75	-0.50	-3.8
ADI	30.13	17.00	Analog Devices Inc.	21.63	-0.50	-2.6
CHPS	15.88	7.88	Chips and Technologies	10.88	-0.13	-1.1
CRUS	61.13	12.63	Cirrus Logic	19.00	-0.50	-2.6
CY	25.75	9.13	Cypress Semiconductor Corp.	10.63	-1.13	-9.6
CYRX	38.75	13.00	Cyrix	11.13	-0.50	-3.7
INTC	83.25	59.81	Intel Corp	81.81	1.81	2.3
LSI	62.50	17.00	LSI Logic Corp	30.88	-1.56	-5.1
LSCC	43.50	19.75	Lattice Semiconductor	27.13	-1.19	-4.2
MCRL	32.50	12.00	Micrel Semiconductor Inc.	18.13	-0.13	-0.7
MU	94.75	30.81	Micron Technology	21.25	-1.50	-6.6
MOT	82.50	44.75	Motorola Inc.	53.25	-1.13	-2.1
NSM	33.63	13.50	National Semiconductor	17.75	-0.50	-2.7
TXN	83.75	46.38	Texas Instruments	44.88	-3.00	-6.3
VLSI	38.13	20.50	VLSI Technology	21.13	-0.63	-4.5
WDC	38.50	14.38	Western Digital Corp.	24.00	-0.00	-2.9
XLNX	55.38	23.25	Xilinx	33.00	-2.50	-8.7
ZLG	42.50	16.50	Zilog Inc.	16.50	-4.75	-34.7
APCC	16.88	7.50	American Power Conversion	11.00	-0.88	-4.3
ARPT	61.50	25.00	Arraytec Inc.	42.50	1.81	-1.7
CREX	12.88	3.00	Cambex Corp.	5.00	-0.25	-0.6
CGN	7.25	3.38	Cognitronics Corp.	4.06	-0.19	-0.6
CREAF	14.13	3.50	Creative Technology Ltd.	3.75	-0.75	-6.3
RACE	8.38	3.63	Data Race Inc.	6.88	0.25	3.8
DTAI	9.38	4.13	Datatrak Corp	7.13	-0.25	-3.4
EMC	23.38	13.00	EMC Corp	20.38	0.13	0.6
EBLA	21.50	6.38	Emulex Corp.	11.25	-0.31	-2.7
ESCC	29.20	16.50	Evans and Sutherland	21.75	-1.25	-5.4
EXBT	22.75	50.00	Exabyte	13.75	-0.41	-4.3
RSLF	4.13	1.50	Intelligent Info. Systems	1.88	0.00	0.0
IOMG	55.13	2.75	Iomega Corp	14.00	-0.81	-5.5
IPLS	8.75	1.88	IPL Systems Inc.	3.13	0.00	1.0
KMAG	37.50	17.63	Komag Inc.	18.00	-1.75	-8.2
MTSI	22.25	13.25	Micro Touch Systems Inc.	15.38	1.50	9.8
PEAK	54.75	17.75	Peak Technology Group	28.50	-2.00	-6.9
PNCL	13.75	4.88	Pinnacle Micro Inc.	7.75	0.50	1.1
AQM	6.75	3.75	QMS Inc.	5.13	0.00	0.0
QNTM	26.63	50.88	Quantum Corp	15.50	0.50	0.0
RDGSC	8.75	0.94	Radius Inc.	1.69	0.00	0.0
SEG	87.75	36.13	Seagate Technology	42.00	-0.63	-1.5
STK	44.13	23.75	Storage Technology	36.75	-0.63	-1.7
STLC	8.75	1.25	Streamlogic Corp.	3.88	0.88	2.2
TEK	61.88	29.75	Tektronix Inc.	38.13	-0.75	-1.9
XRX	87.50	50.88	Xerox Corp (H)	57.50	3.63	4.8
AMSY	33.50	15.38	American Mgmt. Systems	27.00	1.75	6.9
ANLY	43.75	27.75	Analysts Int'l.	41.50	5.88	13.7
AUTO	43.38	32.13	Auto Data Processing	42.38	0.00	1.2
CATP	50.75	15.00	Cambridge Tech. Partners	29.13	0.63	2.2
CBN	54.88	36.63	Cerridan Corp	44.75	2.75	1.3
CDO	26.63	18.88	Comdisco Inc.	26.75	0.50	1.9
CNRZ	54.38	13.63	Computer Horizons	24.88	1.13	4.7
CSC	30.75	59.75	Computer Sciences	71.31	1.88	2.7
TSK	31.50	13.25	Computer Task Group	20.13	-0.63	-2.3
CPU	48.75	13.88	Compusa Inc.	44.25	4.25	10.6
CDAT	37.50	9.50	Control Data Systems Inc.	20.13	1.69	9.2
EGES	13.88	5.00	Edgemark Document Software	7.75	-0.50	-6.6
EDS	58.63	45.88	Electronic Data Systems Corp.	55.88	0.63	1.1
IMAC	28.13	9.13	Imagine Corp (H)	20.13	1.50	5.6
INEL	13.50	3.38	Intelligent Electronics	7.13	0.00	0.0
KEA	47.75	18.25	Keane Inc. (H)	42.63	-2.63	-5.6
MSEL	7.50	2.13	Merisel (L)	2.25	-0.75	-25.0
MICA	16.25	7.75	Micrognic Inc.	15.13	0.50	3.4
PAYX	54.00	26.63	Paychex	52.50	1.44	-2.7
PMS	55.50	35.13	Policy Management Sys. (L)	36.75	1.25	3.5
REY	54.38	31.88	Reynolds and Reynolds	40.63	-1.25	-2.5
SCHI	30.38	14.44	SCB Computer Tech. Inc.	18.75	0.50	2.7
SEIC	26.50	17.75	SEI Corp	31.13	-0.50	-2.3
SMED	72.13	36.75	Shared Medical Systems	54.13	0.13	0.2
SSPE	30.38	17.00	Software Spectrum Inc.	20.50	4.25	16.2
VST	21.38	8.00	VanStar Corp (H)	10.00	-2.63	-12.4
SNDT	46.50	25.25	Sundard Data Systems	42.25	-0.13	-0.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Contacting us by E-mail

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Our postal address is PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

Contacting CW editors

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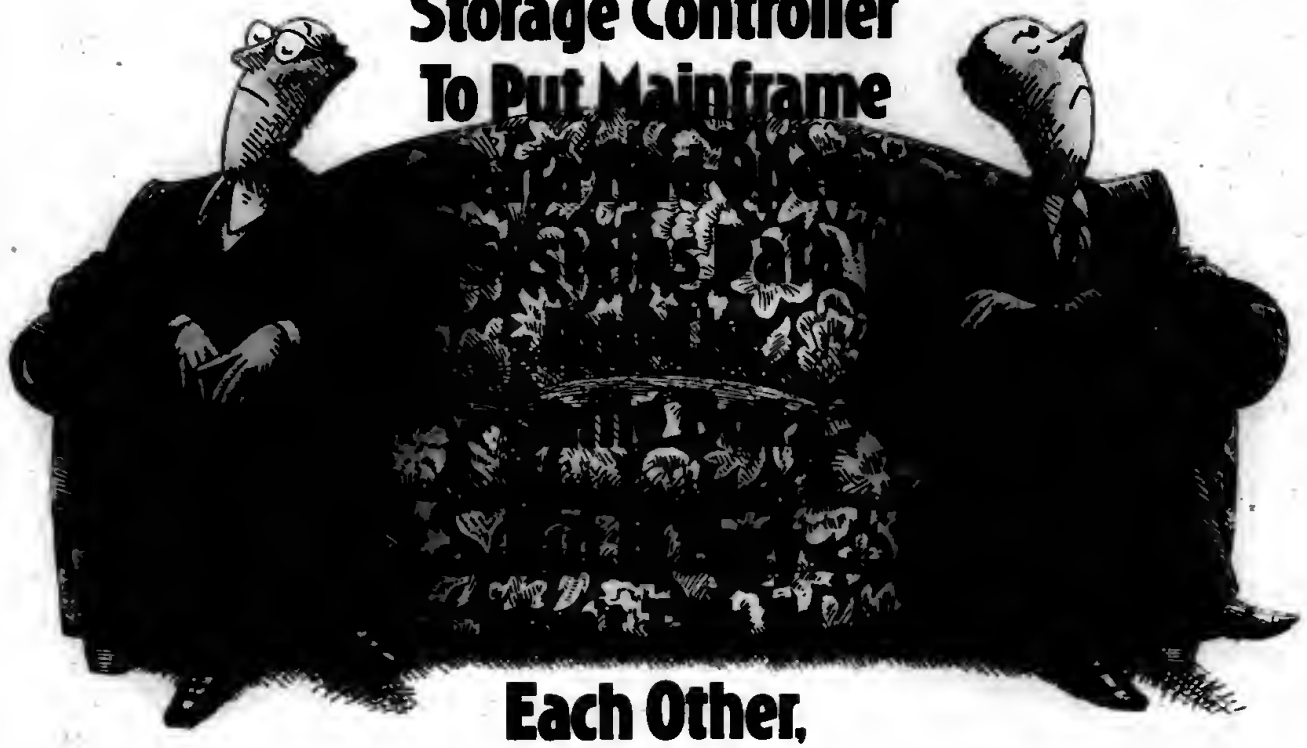

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Directory blocks NT moves

CONTINUED FROM PAGE 1

"Comparing NT Server's domain directory to [NDS] is like comparing a wheelbarrow to a dump truck."

Microsoft won't have a full enterprise directory services product until that part of the Cairo framework ships late next year.

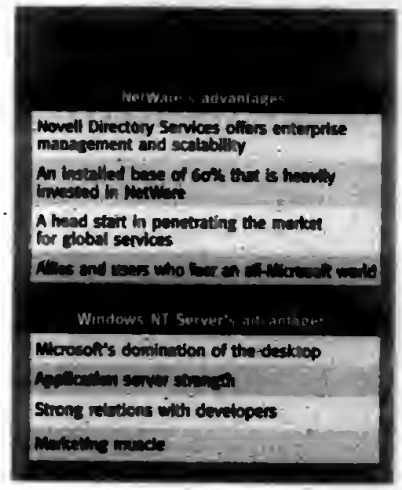
Other users such as Sean Gilbert, MIS manager at Cardservice International, Inc., a transaction services provider in Agoura Hills, Calif., have firmly settled on a dual strategy with NetWare as the primary network operating system and NT Server as the lead database application.

"NDS is a major advantage for NetWare. It gives us unparalleled file- and system-level security. We can't currently duplicate that level of functionality with Windows NT Server," Gilbert said.

EDS' Wayne Stein: *Choosing NT over NetWare will save money*

Craig Restle, president of Systron, Inc., a New York-based systems integrator that sells NetWare and Windows NT Server, said there is "no question" that Microsoft's marketing muscle and worldwide brand-name recognition are having an impact and making inroads into Novell's and other competitors' market share. "It's equally true that with NetWare 4.11, Novell is bringing a lot more functionality to the table. This has made many users who were planning a wholesale migration away from NetWare a year ago stop, take stock and say, 'Wait, I've got a huge investment in NetWare. What do I gain by ripping it out and switching to NT Server?'" Restle said.

Systron has more than a dozen clients, each of which supports 5,000 or more end users. "So far, only two of them are committed to going all-NT Server," he said.


NetWare's advantages
Novell Directory Services offers enterprise management and scalability
An installed base of 60% that is heavily invested in NetWare
A head start in penetrating the market for global services
Allies and users who fear an all-Microsoft world
Windows NT Server's advantages
Microsoft's domination of the desktop
Application server strength
Strong relations with developers
Marketing muscle

Novell has lost very little ground to NT Server at the enterprise level, said Lee Doyle, an analyst at International Data Corp. (IDC) in Framingham, Mass. A recent IDC survey of 985 U.S. corporate sites showed that nearly 60% are still committed to NetWare as their primary network operating system.

The continued unavailability of the Cairo set of advanced directory services for Windows NT has caused many NT Server enthusiasts, including parts of Chevron Corp., to rethink initial plans for a mass migration to the platform.

But NT Server still has staunch supporters. Wayne Stein, project manager for GM Access at Electronic Data Systems Corp. in Detroit, said it was the operating system of choice when General Motors Corp. decided to link 8,500 car dealerships nationwide.

"We are building the foundation for all future development, [and] the feeling here is that Windows NT Server is the [network operating system] of the future," Stein said. "NetWare is very strong in a centralized environment. But it would have cost us 25% to 30% more in extra components to implement a NetWare database server."

Indeed, users said that if NT Server offered directory services equal to NDS or Banyan Systems, Inc.'s StreetTalk, they would consider an all-Microsoft network. But, Gilbert said, "the bottom line is, I can't build my network on promises."

Domain structure limits NT Server

Windows NT Server incorporates a domain directory structure that will let multiple servers share one list of users. It also gives end users a single log-on to their local domain file and application servers and provides a process to establish "trust" relationships among disparate servers.

"[But] this is a very labor-intensive and limiting process. If you've got dozens of domains or groups of servers, the administrator ends up with hundreds of trust connections to keep track of — it's a nightmare that would consume all of a network administrator's time," said Mark Minasi, president of Tech Teach International, a training and consulting firm in Arlington, Va.

By contrast, Novell Directory Services (NDS) will let businesses create a hierarchical database directory that graphically displays every user, object and device on the network from a central location.

Microsoft has promised NDS-like functionality in Cairo directory services.

No firm date has been set for Cairo's release, but it is expected to ship in the second half of next year.

— Laura DiDio

Intranets

CONTINUED FROM PAGE 1

ments, pocket pagers and other mechanisms. It will cost $5,000.

- **Firefly Network, Inc.** in Cambridge, Mass., is scheduled to ship three products aimed at automatically funneling data to user E-mail accounts.
- **First Floor, Inc.** in Mountain View, Calif., plans to ship InfoPilot this month. The product sends updates and changes to corporate data based on predefined user profiles and access privileges. It will cost $3,375 for a server module and 25 user licenses.

Easing the process

Sending data out to users will "prevent a lot of frustration," said Dan Fine, CEO of Fine.com Interactive, a Web consulting firm in Seattle.

Faced with a giant intranet of thousands of pages, "you don't know where to start but at the same time feel you're missing out," said Fine, who has developed intranets for real estate company Windermere Services Co. in Seattle and Microsoft Corp. in Redmond, among others.

Sandia National Laboratory knows that scene well. It was on to the push idea soon after it started its 8,000-user intranet two years ago.

"We learned from experience — the experience of our users telling us when they couldn't find things," said Fran Current, Internet technologies project leader at Sandia in Albuquerque, N.M.

But none of these utilities existed back then. The lab wrote its own Common Gateway Interface and Perl scripts to offer users various subscription services.

"When you have a 100,000-page intranet, finding just what you want can be pretty difficult. We have conscientiously tried to make it easier," Current said.

Intelligent agents

When users aren't pointing and clicking aimlessly for crucial data, networks aren't as clogged, said Karen Isaacson, associate director of human resources information systems at Kraft General Foods Corp. in Northfield, Ill.

Good design can direct user traffic, which Kraft learned after building an intranet prototype this year. "Some [of our] pages are confusing and hard to navigate. Users don't know to scroll or to click," she explained. "That doesn't make for happy users."

Marcam upgrades object-oriented manufacturing software line

By Tim Ouellette

Marcam Corp. this week will continue to eke out improvements to its Protean object-oriented manufacturing software.

Marcam, which competes with software giants such as SAP AG, pioneered the effort to deliver a fully object-oriented line of client/server applications in 1994. But product rollout has been slow, and the company still needs to deliver several modules.

Benefits apparent

Still, Protean users said they are experiencing gains over legacy systems, even while they take the object slow boat. The benefits include lower training costs and faster installation and customization.

"We really like seeing benefits already, without a full implementation of all modules, which we didn't expect," said Bill Friend, group vice president at J. R. Simplot, Inc.

Most users that attempt a client/server installation with competing software try to do it all at once to make sure everything integrates well. Protean 2.0 will add two modules — Plant Planning and Quick Scheduler — and provide full support for Microsoft Corp.'s OLE automation. Protean prices range from $4,000 to $8,000 per seat.

The OLE and object support make it possible to put all the relevant work on one Windows screen, so employees don't have to navigate multiple, character-based application screens as they did in the past.

Although traditional client/server installations have required a large investment in training, users need only six hours of Windows training and six hours of Protean training to get up to speed on the software, Friend said.

"Objects is the direction everyone is heading, but it is not easy, or Marcam would have it done by now," said Bruce Richardson, vice president of research at Advanced Manufacturing Research, Inc. in Boston. "As a result, we are going to see a lot more focus on partnerships" to fill product gaps.

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When bad companies happen to good people

Bob Frankenberg is a great guy — which is exactly why he failed to get the mess at Novell straightened out. Instead of, as we Texans are prone to say, kickin' butt and takin' names, Frankenberg tried to find consensus and create the sort of collegial atmosphere he enjoyed at Hewlett-Packard. He failed rather miserably.

What Frankenberg should have done is cleaned house — replacing the Novell executive mob with people from WordPerfect, which Novell acquired just after Frankenberg arrived. The WordPerfect executives loved Bob and would have been happy to do his bidding throughout Novell. Unfortunately, Frankenberg cozied up to the existing Novell management, and most of the WordPerfect people left.

It's sad, but Novell is about as collegial as your average state prison, with the same sort of fighting among the product groups that you might find among gangs at San Quentin. And there's the battle between Utah and San Jose for control of the company. Ultimately, Novell's corporate culture — culture as in the sort of thing your doctor wants before prescribing antibiotics — is what beat down Frankenberg. He really deserved better.

With Frankenberg out, Novell's board is off doing exactly the wrong thing again. Last time, it decided to hire an Eagle Scout for a gang lord's job. Now, it's trying to replace the Nice Guy with God only knows.

Here's my advice to the board of directors:

Don't hire another CEO — put yourself on the block while you still can. There are several companies that might buy you; after all you're cheap. The value of all your stock is in the $3.5 billion-range and you have a billion dollars in the bank. What a deal! Someone can buy Novell and get enough cash-on-hand to run the company long enough to fix the problems.

But who's the lucky buyer? IBM is out on general principle, Microsoft is out on legal principle, and Hewlett-Packard is out because of the Frankenberg Principle — if he couldn't do it, which of the rest of them can?

Netscape could make the deal fly, and CEO Jim Barksdale just might be able to whip Novell into shape. But why would he want to? 3Com is a possibility, as is Cisco. Or maybe even Electronic Data Systems, which might find the idea of the Novell channel intriguing. If Oracle's Larry Ellison really wants to duke it out with archrival Bill Gates, Novell would give him the opportunity.

Tough-guy Larry might be able to turn Novell around. And then there's always Computer Associates, the big, dark bird that is making slow circles in the sky, waiting to swoop down for a piece-of roadkill.

Novell shouldn't have to die — it still has very good market share, lots of fans, decent goodwill and an excellent reseller channel. But without real leadership and, probably, a new owner, Big Red will end up Big Dead.

Coursey's poetic license has been suspended. When not expressing his primal angst on this page, he can be found at www.coursey.com, home of his electronic industry newsletter, or write him at david@coursey.com.

Microsoft creeps into the enterprise

Is Microsoft ready to supply enterprise systems?

Before answering yes, IS managers must consider Microsoft's many shortcomings. Its NT Server lacks full directory services, NT doesn't scale up as far as many host systems need to go, and it's hard to design an NT network with both a single user log-on and secure administration across domains. In the short run, the answer is no, Microsoft isn't ready.

But in the long run, the answer probably doesn't matter.

Microsoft is still in step with the desktop revolution. It is assembling the right technologies to dominate several layers upward in the organization. It can easily provide for a workgroup or department today and a division tomorrow. I think the way Microsoft is driving NT's modern, modular design tells us that, yes, it will be supplying enterprise systems in the foreseeable future.

Those who claim Microsoft and NT have been left behind by a shift to network computing don't understand how quickly Microsoft has converted itself into a network-oriented company.

Nine months after public attention shifted from Windows 95 to the Internet, Microsoft is providing conversion tools that adapt its applications to the World Wide Web.

Even if others do it better, Microsoft has allowed its customers and legions of third-party developers to remain in step with the Internet.

But even more important than this shift is Microsoft's continued development of Windows NT, which gives the company legitimacy in its pursuit of the enterprise mantle.

G. Pascal Zachary, a *Wall Street Journal* reporter who wrote about the development of NT for the *Journal* and in a book, *Show Stopper*, says NT's 6.1 million lines of code were the result of an intense internal debate.

Windows 95 advocates said NT shouldn't be a desktop system, as originally planned, but should be a higher-level server system.

David Cutler, who led the NT project, had many big operating system ideas, gleaned from his work on the Digital Prism project. In 1985, Digital wanted a replacement architecture for the VAX and put Cutler in charge of the project. It was later abandoned when Digital opted for Unix. But Cutler cherished a competitive desktop role for NT as well.

The result is that NT can serve as both and — along with IBM's OS/2 — is one of the few microkernel-based operating systems that can do so.

Standard PC hardware has almost caught up with what it takes to run NT Workstation, while eight-way, 500-MHz Pentium Pro units will be running symmetrical multiprocessing NT Server at high speeds within two years.

At the Windows NT Intranet Solutions Conference held recently in San Francisco, bitter Microsoft competitors Steve Jobs of Next Software and Bill Reedy of IBM's Large Scale Computing Division urged their respective audiences to use Next and IBM products under NT. "IBM isn't trying to argue with the marketplace," Reedy said.

It was a telling moment because only IBM has done what Microsoft aspires to do. Microsoft wants to set the enterprise environment and let others follow.

Because of its dual desktop/server roles, its product line is becoming an intranet supply line, and in the background is the sound of marching feet.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

New-wave Macs. *The Macintosh always stood for leading-edge design and usability, but in recent years rivals have caught up. So* Macworld *magazine (www.macworld.com) and Frogdesign dreamed up two provocative prototypes to help nudge Apple Computer out of its design slump. In theory, the futuristic designs — a desktop Macintosh on the left and a laptop on the right — could be produced as early as next summer, the designers said.*

alt.cw

These recently issued U.S. patents were gleaned from MicroPatent's Patent Server at www.micropat.com. (Patent number, inventor/assignee, date issued)

A mobile nursing cart. In addition to carrying medical supplies, the cart has a mobile PC for bedside record-keeping and wireless transmissions to a host computer. (5,536,084, Grandview Hospital and Medical Center, July 16)

A car-collision-avoidance system run by a neural network. The system is trained to predict crashes and then warns the driver or automatically takes evasive action. (5,541,590, Takata Corp., July 30)

A method for storing 11-digit floating-point numbers in an encoded, compressed format. This is more convenient for spreadsheet users who need only three or four digits. It reduces memory requirements by 50%. (5,542,068, Microsoft, July 30)

A secure method for renting software. The remote user downloads the software from a host computer and uses it while maintaining a communications link with the host. To prevent copying, the software application has an embedded security module that disables the software if the communications link is broken. (5,548,357, Mohan Ananda, Aug. 20)

Inside Lines

Vanity affair

In an effort to spice up its image, Genesis Technology Group, Inc. recently signed Denise K. Smith as director of public relations. Smith, better known as Vanity — the former singer/actress/model who hung around with the artist formerly known as Prince — might end up following the advice from her mid-1980s songs, such as "If a Girl Answers (Don't Hang Up)" or "Drive Me Wild," to add pizzazz to the Reston, Va.-based computer systems company.

DEC knows marketing

Digital is getting ready to launch a new advertising campaign. According to the newsletter "Shannon Knows DEC," several prototypes were ruled out, including one that portrayed Network, Sun's spokeshound, and urged customers to "buy an Alpha, or we'll shoot the dog." Another aimed at IBM noted that while solutions for a small planet were all well and good, Digital would rather focus on a planet the size of Earth.

Fashionable Web site

New York's Fashion District this week will unveil an Internet-based interactive kiosk that industry visitors can use to locate Big Apple retailers and make appointments. The interactive kiosk and a Fashion District Web site (www.fashioncenter.com) will be hard to miss. The octagonal structure at the corner of 39th Street and 7th Avenue will sport "the world's largest button" held aloft by a 31-foot steel needle.

Sprinting to Spectrum

The outsourcing arm of Sprint Corp. in Westwood, Kan., plans to manage customers' networks through Spectrum, Cabletron's distributed platform. A leak from Cabletron in Rochester, N.H., described plans to blare Spectrum's win over Hewlett-Packard Co.'s market-leading OpenView at Networld/Interop '96 next week in Atlanta.

Frat houses of the rich and famous

While Microsoft billionaire Bill Gates is still crafting his dream house, co-founder Paul Allen built the frat house of the future. For $3.1 million, Allen replaced the Phi Kappa Theta house at Washington State University, his college home in the early 1970s. The four-story brick house boasts a computer center and climate-controlled bedrooms jacked for voice, data and cable TV.

Powerful jokesters

Power Computing Corp. is one of the most outspoken boosters of the Macintosh flag. Power Computing's high-altitude antics (they had a 225-foot bungie tower at Macworld Expo in Boston) have included T-shirts distributed at Macworld that said "Let's Kick Intel's Ass" and another T-shirt proclaiming multimedia as the domain of the Macintosh. At Macworld Expo in January, Power Computing will sponsor MacFest, which reportedly will feature headliners Green Day and Lyle Lovett. U2, singer Peter Gabriel and comedian Robin Williams are also on the list but aren't yet confirmed. The show is free, but you have to attend Macworld to get a ticket. Now that's one way to boost show attendance.

The Internet's first beauty pageant is under way. The owner of a Budapest computer company is sponsoring the Miss Cyberspace Hungary contest at www.datanet.hu/artnet/beauty. Contestants send photos for scanning and posting; visitors judge the images; and winners continue to a final round in December. Virtual beauty may be in the eye of the browser, but Computerworld *news editor Patricia Keefe will judge your tips at (508) 820-8183. Or send your news (no digitized photos, please) to patricia_keefe@cw.com.*

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As information technology moves into the 21st century, network access to information will be much simpler and more affordable. Users will access data via dramatically faster networks, and information will combine text, graphics, audio and video. A fully open and deregulated environment will encourage connectivity that spans the globe, touching us all at work, home and play.

The organizations featured in this supplement are at the forefront in applying network computing to advance communications. 3Com proudly recognizes their vision, and their understanding of the value inherent in access to information technology.

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THE NETWORK 25

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COVER PHOTOGRAPHY: DENNIS ORTIZ-LOPEZ

Bruce Rayner

John Gallant

Anne McCrory

Tom Monahan

Bob Fink

Amy Malloy

Mari Keefe

EDITOR'S note

Net Work

WELCOME TO THE NETWORK 25, a joint production of *Computerworld* and *Network World*. Nominated by editors in 18 countries and written by reporters from all four corners, our issue includes some outstanding and imaginative networking users.

Whether in Chicago, Sao Paulo or Johannesburg, these 25 companies face similar issues: How do we connect far-flung operations to create a true global organization? What does global telecommunications reform mean for our ability

CONTRIBUTING WRITERS

Jeanette Borzo, *Paris*
Simon Cashmore, *South Africa*
Vinita Chawla, *India*
Ron Condon, *U.K.*
Marc Ferranti, *Paris*
Anna Foley, *Hong Kong*
Mark Gibbs, *USA*
Rob Guth, *Japan*
Elisabeth Horwitt, *USA*
Paul Korzeniowski, *USA*
Erivelto Tadeu, *Brazil*
Joanie M. Wexler, *USA*

Eric Pratt

to communicate across international borders? What will the impact of the Internet and intranets be on the company's business?

No doubt, those are the same questions that keep you up at night too.

In some parts of the world, the issues are even more complex. In China, for instance, a central government sets policy. In Japan, culture and tradition have slowed the transition to a network-centric business model. South America and Africa share "emerging economy" issues. And Europe has a unique set of multicultural obstacles to overcome as it stumbles toward something resembling economic unification.

All the stories behind these 25 companies are relevant to your company, especially if you have or plan to have an international presence. Use them to benchmark your own networking capabilities.

BRUCE BAYLIS

THE NOMINATING COMMITTEE

ARGENTINA
Ruben Argento
Computerworld Argentina

BRAZIL
Erivelto Tadeu
Connections

BULGARIA
Krastmir Bankov
Computerworld Bulgaria,
Network World Bulgaria

FINLAND
Timo Poropudas
Rietoverkko/-
Tietoverkko

FRANCE
Marc Perranti
IDG News Service

HONG KONG
Don Tennant
Computerworld

INDIA
Vinita Chawla
Computerworld India

ITALY
Alessandro Degli Occhi
Networking Italia

JAPAN
Rob Guth
IDG News Service

NEW ZEALAND
Don Hill
Computerworld New Zealand

Amanda McVitty,
Network World New Zealand

POLAND
Bronislaw Piwowar
Network

ROMANIA
Mihaela Gorodcov
IDG Romania

SINGAPORE
Gerald Wee
Computerworld Singapore

SPAIN
Francisco Sanchez
Comunicaciones World

SOUTH AFRICA
Jocelyne Bayer
Network World, South Africa

SWEDEN
Lars Dahmen
Computerworld Sweden

U.K.
Jerry Sanders
Computing

CONTRIBUTING EDITOR
Steve Ulfelder

COPY EDITORS
Jamie Eckle
Pat Erickson

PRODUCTION MANAGER
Beverly Wolff

GRAPHICS COORDINATOR
Kim Pennett

COMPUTERWORLD MAGAZINES EDITOR
Alan Alper

EDITORS IN CHIEF
Paul Gillin, *Computerworld*
John Gallant, *NetworkWorld*

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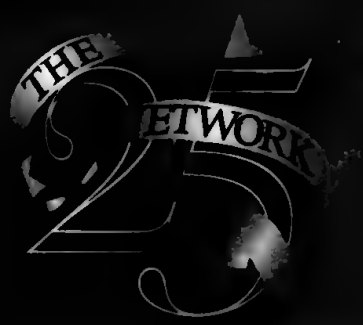


Outstanding users of networking technology from around the world

Executive SUMMARY

World-wise

Effective networking distinguishes these 25 global companies.

THE 25 COMPANIES LISTED on the facing page share one common characteristic: Every one is an innovator. Whether it's *The Times of India*'s commitment to creating the country's first major intranet application or Brazil's Banco Bradesco's eagerness to tap new technologies to expand its international business, these 25 firms are all pushing the networking limits.

Of course, business challenges differ. First National Bank in South Africa is adapting to a post-apartheid regime by expanding its banking network into new areas. Amoco Corp. is working to improve connections between oil exploration vessels and platforms in remote locations. And ABB Asea Brown Bovari Ltd., the $30 billion Swiss engineering company, must decide how to standardize communication among its roughly 1,000 companies in 140 countries without compromising their autonomy.

Still, some themes run through all 25 companies. Indeed, they resonate with all companies exposed to global competition:

- **Global Reach** *(page 20)*. Multinational firms are struggling with how to transform themselves into global companies. Global companies have well-integrated operations, whereas multinationals have stand-alone regional operations. Global networking buys companies higher productivity and close connections with their customers and suppliers.

Take Benetton Group SPA. The $1.9 billion Italian clothier is a virtual corporation that draws on the capabilities of 120 participating companies in 30 countries. The results speak for themselves: Both revenue and net profits were up last year.

At Black & Veatch Corp., the $1.1 billion engineering company with 80 offices worldwide, the challenge is to get information to engineers in remote locations to construct public utilities. The cost savings of effective networking can be counted in the millions of dollars, the company claims.

One of SmithKline Beecham PLC's networking initiatives is to improve supply chain management by the way its employees communicate with customers and suppliers. As one executive at the U.K.-based international pharmaceuticals firm puts it, "Any im-

Continued on page 8

Betsy Lyon

TECHNOLOGY PROFILES

To be nominated for the Network 25, companies had to excel in at least one of these technology areas. For the complete methodology, see page 49.

SWITCHED NETWORKS. Where traditional LANs require users to share capacity on network links, switched network technologies provide instantaneous connections between two networks' devices. That allows them to share information at much higher speeds. The link is maintained for only as long as the devices communicate, in much the same way that a telephone network supports a link between two phones during the duration of a call.

The way such connections are made depends on the network's architecture; most corporate networks today have so-called shared-LAN architectures, such as Ethernet or Token Ring. These technologies are running into capacity problems where bandwidth-heavy multimedia and collaborative computing applications are in use. Global networking leaders are deploying new technologies such as Asynchronous Transfer Mode (ATM) and switched Ethernet to support such new uses.

MOBILE/REMOTE COMPUTING. Using a computer off-site and connecting to the company network via modem, wireless technology or other means. One of its dirty little secrets: the inferior service errors to applications and information its users get. Leaders here are using innovative techniques to put all corporate network users on equal footing and bring the power of networking to every aspect of the company.

Continued on page 8

Bessa Lyons

TECHNOLOGY **PROFILES**

Continued from page 7

INTERNET/INTRANETS. The Internet, and its graphical component, the World Wide Web, is the interconnected tangle of global networks. Intranets are in-house networks that use Internet technologies but are protected from outsiders by firewalls. Both are having a profound impact on how companies provide service to their business partners, customers and internal users. Leaders are extending their businesses electronically to market, sell and support products; internally, they are simplifying operations through intranets. Such organizations are seeking easier access to information, applications and useful services.

INTERNETWORKING. Corporate networks today are really internetworks, a quilt of interconnected LANs and WANs that support a variety of applications and departments. Leaders in this area are deploying technologies such as routers, intelligent hubs and virtual LANs in innovative ways to make it easier for workers to collaborate on projects and allow leaner, flatter organizations to respond more quickly to changing market conditions. The internetworking arena itself is undergoing dramatic changes, as new high-speed technologies offer more options and as mergers and acquisitions change the competitive landscape. The top internetworking users are staying ahead of the curve, enabling their networks to support more users and network-intensive applications.

NETWORK MANAGEMENT. The area devoted to managing and controlling all the components on a network. Demands on the network grow exponentially, but the resources and skills to manage networks grow much more slowly. Technology, ironically, offers only a limited set of answers for network management problems. Leaders in this area have adopted new, intriguing approaches to managing their networks and the applications that reside atop them.

GROUPWARE/COLLABORATIVE COMPUTING. Software that automates a task among multiple workers or that helps workers anywhere in a company share information, work on projects and tap into the greater corporate knowledge base. Companies that build and deploy such applications outpace peers that may have spent billions building global information networks but use largely un-networked applications.

GLOBAL NETWORKING. Building a network that supports sites around the world. Leaders here know what it means to deal with differing regulatory requirements, wide-area network services, equipment suppliers, support offerings and labor markets. ●

Continued from page 7

provement in communications [translates into] savings and competitive advantage."

● **Use of the Internet** *(page 31).* The Internet has the potential to change the economics of competition. The 'net allows small firms to meet millions of potential customers in a way that wasn't possible just a few years ago. And it breaks down international barriers: Companies worldwide can now compete with U.S. firms in their own backyards.

While the Internet helps them compete globally, Intranets enable them to improve productivity. *The Times of India,* for example, is setting up the country's first major intranet in an attempt to streamline many business functions, further enhancing its ability to compete.

Another issue many companies face: how to save huge investments in software such as Lotus Notes in an increasingly Internet-centric world. ABB, with 50,000 Notes users, is figuring this out.

● **Telecom Reform** *(page 14).* One of the biggest question marks in any company's long-term networking strategy is the implications of global telecommunications reform. A truly international phenomenon, reform is at different stages in virtually every country in the world. Experts present any number of scenarios for how reform will unfold between now and 2000, the deadline for an international agreement set by the World Trade Organization. What to do in the interim? Don't sign too many long-term contracts.

● **Asia's Ascendance** *(pages 9, 26).* The Pacific Rim is a hotbed of networking activity. But all nations are moving at their own speed. Japanese companies, once considered invincible by their Western counterparts, are viewed as far behind when it comes to networking. But as the country emerges from recession, some progressive companies, such as Matsushita Electric Industrial Co. and Kao Corp., are proving the value of networking to their peers.

China is coming on strong with billion-dollar infrastructure investments planned for the next five years. Current investments are spotty at best, but cities such as Shanghai are making great strides in improving their networking capabilities. ●

Down but not out

TOM WAGNER/SABA

D+ Naotaka Furukawa *says Matsushita's network expansion into China will save money and test new technologies*

UNTIL RECENTLY, the term "networking" in Japan was used solely to describe the expansive web of contacts necessary for success in a country built on personal relationships. Measured in stacks of business cards and empty bottles of hangover elixirs, your average Japanese office worker's network had little to do with PCs, Ethernet or domain names.

Still riding high from their success in the booming 1980s, Japanese companies in the early part of this decade were convinced their manufacturing prowess could sustain them forever. They did little to streamline their operations through PCs and networks.

"Until 1992 most Japanese businesses were quite complacent," says Shumpei Kumon, a member of several government information technology advisory groups and executive director of the Center for Global Communications (Glocom), a think tank in Tokyo. "They felt Japan and Germany had won and the U.S., like the Soviet Union in the Cold War, was the loser."

It was not to be. Japan sank into a recession and the yen hit record-breaking levels, squeezing profitability out of Japan's exports. Moreover, companies realized that Japan's vaunted lifetime employment system had actually created a herd of bloated, inefficient behemoths.

Meanwhile, the U.S. — where Vice President Al Gore had just proposed his National Infrastructure Initiative (NII) — appeared to be moving quickly ahead in the eyes of Japan's business and government leaders. Japan's former sense of invulnerability that prevailed at the height of its economic bubble now turned into a realization that the island nation might lose the race into the Information Age.

Sustained by *manufacturing success, Japan almost forgot to come to the networking revolution. Now it's catch-up time.* ➔ **By Rob Guth**

"Japanese businesses' confidence was replaced by a sense of incapability," Kumon says. The companies saw the U.S. shift from "bashing Japan to surpassing Japan."

A February 1995 cover story in the international version of *Time* magazine summed it up: "Missed Connection: Japan plays catch-up on the information highway."

And what a frenetic catch-up it is.

In the roughly five years since news of Gore's proposal first hit the upper reaches of Japan's government, the country, in fits and starts, has embarked on a frantic bout of network building.

Down but not out

On the office level, that means LANs. Though Japan still lags far behind the U.S. in PC and LAN penetration, the PC market exploded last year, growing nearly 70% over 1994. Next year, nearly 50% of all companies will have LANs, nearly twice the number in 1994, according to market researcher IDC Japan Ltd.

On the global front, many of Japan's multinationals have quietly begun building and expanding high-speed networks that link their global diaspora of subsidiaries, affiliates and partners.

To be sure, the road hasn't been easy, nor are Japan's businesses in general particularly wired. Strict regulations initially hindered the growth of the Internet, and persistently high leased-line tariffs controlled by a recalcitrant Nippon Telegraph and Telephone Corp. (NTT) continue to hamper network growth.

Perhaps the biggest example of the government's groping is an ambitious NII plan of its own, announced in May 1994 by the Ministry of Post and Telecommunications (MPT). It calls for a nationwide fiber-optic backbone to be built by 2010 at a cost of up to a whopping 55 trillion yen, or about $55 billion. The network, which is to be jumpstarted by low-interest government loans, would create a market worth 123 trillion yen ($1.23 trillion) by 2010. That far surpasses the size that Japan's automobile and electronics industries are each expected to reach in the same period.

Hidetsugu Nishizawa

"1996 is the year of the Internet in Japan," *says Shumpei Kumon, executive director of the Center for Global Communications in Tokyo.*

In short, the grand plan has largely been dismissed as a pipe dream, and most business leaders have stopped waiting for their government to lead by example.

"We are a global company — 75% of our business is outside Japan — so we essentially don't care about the [national] information superhighway," Nobuyuki Idei said soon after the MPT plan was announced and before he became president of Sony Corp. in April 1995.

Idei's sentiments are echoed by droves of top executives. Pressed by the need to improve their white collar efficiency at home and in many cases link together their extensive operations around the globe, businesses have found a new lease on life through networking in the IT sense of the word.

Consumer electronics giant Matsushita Electric Industrial Co., the company behind the Panasonic, National, Quasar and Technics brand names, links — in addition to 500 Japanese business units — about 100 of its 183 overseas operations with a network it calls PanaVan.

Running at speeds between 128K bit/sec. and T1 (1.5M bit/sec.), the network carries internal voice, fax and data traffic. It has also streamlined the exchange of purchase-sales-inventory, shipping and general business planning information, according to Naotake Furukawa, leader in the planning department at the company's Osaka network center.

Having established hubs in Malaysia, Hong Kong, Taiwan and the Philippines, Matsushita is now expanding PanaVan into China. It expects by year's end to link 34 operations across the world's most populous nation.

In part, expansion of the network in Asia has been indirectly driven by the high yen. As exchange rate pressure has forced Matsushita to shift manufacturing to lower-cost sites outside of Japan, the network has followed as a means to manage the growing number of offshore sites.

The biggest benefit to date has been a cut in communications costs — the China expansion will reduce Matsushita's China communications costs by a reported 20%. The network is also a test bed for new technologies and services that Matsushita may one day make money on, according to Furukawa.

As for the Internet, most of the activity has been focused on building World Wide Web sites, but more advanced use of the Internet is beginning to take hold, observers say.

"1996 is the year of the Internet in Japan," Glocom's Kumon says confidently.

Osaka-based Kansai Electric Power Co. is constructing a TCP/IP-based intranet that by 1998 will link roughly 10,000 employees using Lotus Development Corp.'s Notes at the company's 111 offices in Japan's Kansai region, an official says. Reportedly costing roughly 5 billion yen ($46.7 million), the network will be one of the first large-scale intranets to hit Japan.

To be sure, advanced internetworking is still the exception in Japan. In part, high access charges — Internet access fees in Tokyo are roughly 10 times what they are in Silicon Valley — have constricted growth. But those charges might soon be history if NTT becomes an Internet provider and, using a fiber-optic backbone, lowers access fees to roughly equal what they are in the U.S.

But though prices will fall, a more entrenched obstacle remains: managers' resistance to change.

Complains Mikio Arai, webmaster at Pujitsu Ltd., "Over 50% of my time is sacrificed battling managers who don't understand the importance of the network or the future role the network will play in their lives." ●

GUTH is Tokyo correspondent for the IDG News Service.

Commentary

BY Shuji Honjo

Catching on?

TO GET A [redacted] of just where Japan stands when it comes to networking, consider these statistics:

- Last year only 14% of Japanese workers had PCs. In the U.S., 47% of workers did.
- Only 35% of Japan's PCs are networked, compared with 82% in the U.S.
- Japan has 160,000 host computers for the Internet. The U.S.? Four million.

There are many reasons for the lag, involving economic, cultural and technological factors.

From an economic standpoint, Japanese users often argue that high telecommunications costs limit networking activities. Nippon Telegraph and Telephone Corp., the country's dominant telecom provider, is a monopoly and keeps prices high.

Culturally, long-standing practices of keeping tight reins on the flow of information within companies has discouraged network proliferation. Capable people often try to keep important information to themselves. In a country with a penchant for hierarchy and consensus management, internal networks are often viewed as a threat.

And between companies, networking is hampered by the love affair with custom software. The result is that simple data exchange from one business to another is often quite difficult. The bottom line: Industry standards for data communications have been slow to evolve.

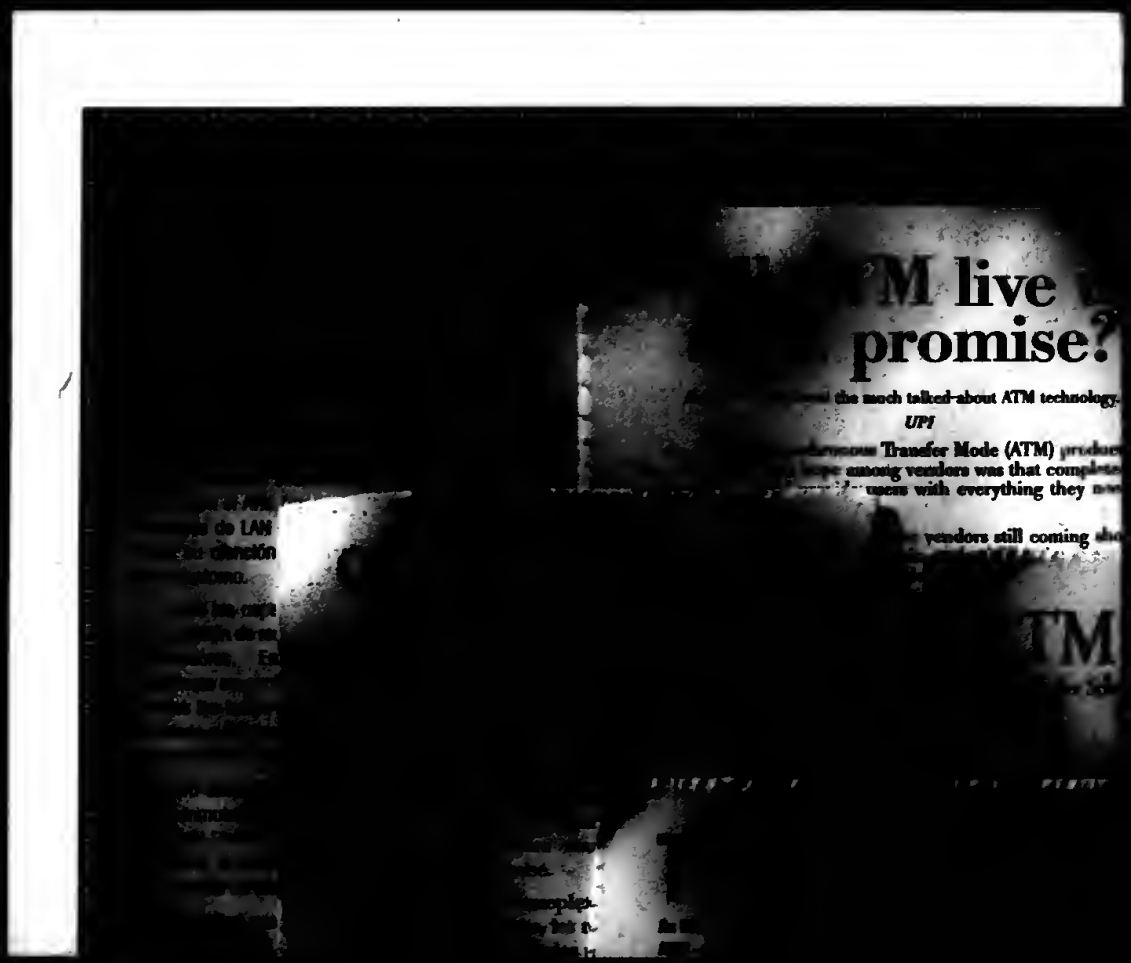
Technical problems inhibit networking, too. Typically, Japanese companies are committed to proprietary platforms from the likes of IBM, Fujitsu, Hitachi, NEC and others. Few have a consistent strategy to deploy open systems. It's not uncommon for several incompatible platforms to be deployed, making the situation worse.

But there are exceptions. A few innovative companies are embracing network-centric IT strategies and succeeding. Take Kao Corp., a supplier of cosmetics, soap, disposable diapers and other consumer products. It has shifted from multiple platforms and data formats to a compatible platform and integrated data formats, and from central computing to distributed computing with shared databases. It is experimenting with a "virtual factory," whereby two factories are controlled as one through a high-speed digital network.

It's not too bold to say that networking will drive Japanese corporate renewal in the 21st century. Early innovators are the bellwethers. ●

→ HONJO *is manager of business planning at CSK Corp., a professional services firm in Tokyo. He has extensive experience in business consulting and venture investment around the Pacific Rim.*

Photo: Tom Wagner/SABA/Photoillustration: Eric Pfaal



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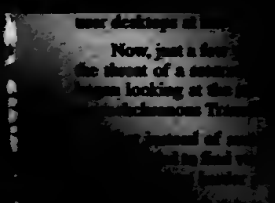

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SUSAN LEVAN

a better connection?

Telecom reform around the world promises better, cheaper, faster service for corporate customers. But when will the payoffs materialize? → BY **Paul Korzeniowski**

LAST YEAR, Zurich-based ABB Asea Brown Boveri Ltd. wanted to install a global frame-relay network to support its operations in Asia, Europe and the U.S. that used Lotus Development Corp.'s Notes groupware.

Carriers were willing to give the company a networking deal for five, seven or even 10 years, but ABB demanded a two-year contract. "We do not want to get locked in to a long-term deal which would seem overpriced and obsolete in a few years," says Lars Sandel, a telecommunications manager for the corporate information systems staff in Zurich. ABB got what it wanted.

Telecom analysts agree that Sandel was wise to hold out. The rapid pace of telecom reform around the world will wreak havoc with service and pricing schemes during the next few years, they say. After years of posturing and often fruitless negotiations, many countries have begun moving earnestly toward telecom deregulation.

Significant work still lies ahead, but the pace is quickening and will alter the way that large international corporations build their networks.

The most obvious change: a smorgasbord of choices. In many countries, the national telephone monopoly is the only game in town, it carries every network connection. With deregulation, those nations will have at least two, and perhaps as many as a dozen, alternate suppliers.

Increased competition will bring lower rates, especially for businesses. New carriers, which don't have the infrastructure to reach all residents, typically target commercial customers. For example, London-based Mercury Communications Ltd. went after the business customer when the U.K. deregulated its services in 1984. To fend off the attack, giant British Telecommunications PLC (BT) cut its business rates while maintaining prices for residential service, says Eric Owen, an industry analyst at the London office of International Data Corp. (IDC), a market research firm.

Today, Great Britain is one of only a handful of regions with a competitive telecom market; Finland, Sweden and the U.S. are others. During the next three to five years, however, the number of deregulated markets could increase to more than 50, changing the global landscape.

SINGLE SOURCE

Besides offering lower rates, carriers are building end-to-end global services geared to large corporations such as ABB. Currently, firms have to station network managers around the world to deal with local carriers and monitor network performance. Many would prefer to hand that task over to telephone companies.

Carriers have begun teaming up and building single-source international services. One of those services is WorldPartners, which includes AT&T Corp., Kokusai Denshin Denwa Co. in Japan and Singapore Telecom. Another is Phoenix, a joint venture among Deutsche Telekom, France Telecom and Sprint Corp. Still another is Concert, a collaboration between BT and MCI Communications Corp. to sell global services. In June, Concert unveiled an international Internet access service. "Every large company is struggling with ways to get its users on the Internet, so this service is well-timed," IDC's Owen says.

Continued on page **18**

free enterprise

➔ BY JEANNETTE BORSO

FOR GREGORY DMITRIEV, telecommunications deregulation has meant more than just the right to provide services previously monopolized by the state government. It's meant the right to self-determination.

"Deregulation — I don't think it's the right word," says Dmitriev, president and CEO of IncomA in Moscow. "Privatization" is a better term, he says. It is privatization that enabled Dmitriev to set up his company and create FastNet, the first frame-relay network in Russia, in 1993.

"In the States, deregulation means that the local exchange provider can provide long-distance services. What happened in Rus-

➔ **IncomA's Gregory Dmitriev** *set up Russia's first frame-relay network in 1993. 'There was no way to do something like this before [privatization],' he says.*

sia is more like [private companies getting] the right to install private telecommunications services," Dmitriev explains.

Dmitriev started his business in 1990 — just two years after perestroika and the push to privatization began — by setting up electronic-mail services for the Central Bank of Russia. "After a year of operations, we got a problem with connectivity, and we needed a network to provide good service," Dmitriev says. "We put in a couple of nodes, got several customers and realized we must extend the network. Now we have seven nodes."

IncomA expects to add another two or three nodes in Moscow soon and 10 around the country later. IncomA, which currently has some 300 clients, is adding about five customers per month.

Rather than working with the Moscow city telephone network — the formerly state-owned agency that is now partially privatized — Dmitriev has found it less risky and more cost-efficient to use a variety of private providers, including the Moscow subway and the Ministry of Railways, for network cable and nodes. ●

➔ **BORSO** *is an IDG News Service correspondent in Paris.*

Continued from page **15**

Because the partnerships are so new — formed only during the past two years — they are experiencing start-up pains. "The teams need to connect their networks, train their staffs and package their service offerings," notes Joanne Downey, director of European telecommunications research at Giga Information Group in London.

"Because these carriers are so large and the task is so complex, their progress has been slower than customers desire," Downey says.

SUSAN LaVAN

Decreasing quality of service could prompt a firm to switch carriers

Industry analysts agree the partnerships have potential. The teams should relieve network managers of the headaches of troubleshooting international lines. They have significant clout, too, which will help them negotiate with national carriers and offer lower rates.

But the joint ventures are no panacea: They are strong in a handful of countries but leave much of the globe uncovered. To address this problem, the teams are expected to add members during the next few years. Eventually, every major carrier may team up with one of those groups.

QUALITY IN QUESTION

Of course, there is a cost to reform. As competition intensifies, carriers will have to become more cost competitive, and that usually leads to downsizing.

Since deregulation occurred, BT has cut its staff in half, from 200,000 to 100,000. And in a dozen years, AT&T and its seven subsidiaries have cut 120,000 employees from the payroll; the company plans to sever 40,000 more workers during the next few years as part of its recent breakup.

Such constant cutting affects corporate network performance.

Just ask Harry Tompkins, manager of Internet services at Ciba-Geigy Corp., located in Tarrytown, N.Y.

"Carriers have eliminated many experienced middle-level managers," Tompkins says. "Consequently, network quality of service has been slipping. Problems are more frequent, and fixing them takes more time."

To date, the issue has been annoying rather than catastrophic. But decreasing quality of service could prompt a firm to switch carriers. Global companies such as ABB, with short contracts, will be in the best position to adapt. ●

➡ **SCHEIDEWEG** *is a freelance writer in Malden, Mass. He can be reached at paulkorzen@aol.com.*

Commentary

BY Daniel D. Briere

Don't hold

CONVENTIONAL WISDOM has it that by late 1997 or early 1998, the launch of international communications competition will usher in a new age of global telecommunications. This belief has been fueled by telecom reform in the U.S. and across Europe and, on the international stage, through the World Trade Organization's (WTO) telecom talks.

The reality, however, is that the race among communications carriers has already begun. Most carriers vying for foreign business, such as AT&T with its WorldPartners, MCI with its Concert effort and Sprint's GlobalOne venture, are beginning to look like marathoners at the 20-mile mark — still running but getting awfully tired. Users, too, are reaching exhaustion. They are tired of unfulfilled promises of one-stop shopping, integrated billing and single customer support numbers.

Improvements are in the offing, but don't hold your breath. Until the myriad national and international rules are firmed up, there will be a lot of talk and a flurry of activity behind the scenes, but little substantial change. Users will still be dealing with multiple providers, networks and support centers, even if they have one pretty-sounding marketing name, like GlobalOne, WorldPartners or Concert.

Don't expect a sprint to the finish line from these companies, either. Some factors will sap the energy from even the fittest of the fit:

1. Setting the rules. Even though the industry is moving toward greater competition, continued ambiguity of the rules — such as what types of resale are allowed — will keep the pace of reform slow. The investment necessary for huge partnerships such as WorldPartners, Concert and GlobalOne is heavily influenced by the exact interpretation and implementation of regulations, and until regulations are finalized, caution will be the watchword.

2. The pace of technological change. While most such change is rapid, changes to "customer-facing" systems always take time and money. These billing, customer sup-

your breath

port, network management and sales support systems take years and millions of dollars to implement. Typically, the investments are made reluctantly, without clear rules as to how services can be provided and charged for, and therefore billed.

3. Uneven application. As recent spats between the U.S. and other carriers in the WTO telecom talks show, telecommunications reform on a global basis is a politically charged issue. Each country will have its own interpretation of what "fairness" will entail, and rules will vary from country to country. These inconsistencies will contribute to the slow adoption of true global solutions. And it's not just Third World and Asian countries that are attempting to protect their home markets, either; Western countries such as Portugal and Austria are also dragging their feet on adopting "open skies" telecom policy.

For large multinational companies with many overseas operations, changes in regulatory rules will allow major carriers to implement custom systems, such as virtual private networks based on a single network architecture and supported by resale of private lines. Smaller firms should not expect an immediate flood of improvements. However, they will be able to find some good deals on international connectivity from smaller global providers, such as Telegroup, Inc. in Fairfield, Iowa, and Viatel, Inc. in New York.

As corporate managers look at this uncertain international marketplace, they should keep in mind that this market is changing rapidly. Much domestic telecom technology has become mature, but that isn't true of the international market. Understanding the offers available, keeping abreast of new services and providers, and keeping options open during negotiations as the market develops will allow corporations to take advantage of the best that competition has to offer. ●

DRIERE *is president of Telechoice, Inc., a Verona, N.J.-based telecommunications consultancy. He can be reached at dbriere@telechoice.com*

How fast is the 28.8 modem in your combo PC Card?

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"In a virtual corporation, information systems and communications are the real organization."

Bruno Zuccaro, vice president of IS at Benetton

The Global **IMPERATIVE**

right here, **right now**

By Elisabeth Horwitt and Ron Condon

ZERO DISTANCE BETWEEN USERS. That was the call to arms at Black & Veatch Corp., the $1.1 billion global engineer and constructor, as it built a global network during the past decade. Making sense of the labyrinth of leased lines and VSAT connecting 6,000 PCs and 6,100 professionals in 80 offices worldwide was a challenge. The

Enrico Bossan/SABA

Alan McKnight

slogan helped focus the information systems staff on the task at hand; it also makes a good rallying cry for any IS department struggling to globalize its network.

There's no question that removing the distance barrier is the next frontier for many international organizations. A design engineer 7,000 miles away needs the same information as the marketing executive at company headquarters. In the same interface. At the same time. Now.

Of course, not all companies approach the task of connecting far-flung operations the same way. Cultural differences among companies and regions of the world ensure that. But surveying a handful of global networking innovators in the U.S. and Europe reveals some common themes — and some differences — in the quest for zero distance between users.

WHY GET CONNECTED?

Higher productivity. Kansas City, Mo., home of Black & Veatch (B&V), is a long way from the island of Pagbilao in the South Philippines. Which, in turn, is a long way from civilization — and not just the 100 miles to Manila. Engineers who traveled by small boat to the island to build a power plant found people who lived in grass huts, says Greg Moore, network manager. Facilities were limited, at best: "They only had diesel-generated electricity. The only water was desalinated. And the only communications were cellular," he recalls.

It took a combination of a satellite-based VSAT network from Pagbilao to Manila and terrestrial connections from there to Kansas City to provide an adequate communications infrastructure for the island site, Moore says.

Such links are well worth the trouble. For one thing, they give B&V project teams access to PowrTrak. The decade-old, constantly evolving system gives engineers in remote locations access to computer-aided engineering, project control and engineering design applications and a huge repository of data and designs. By drawing on the experience of their peers and past projects — using past designs as building blocks for current, similar projects, for example — B&V engineers can significantly lower turnaround time and costs.

Take the recent construction of a power plant in Michigan. Using PowrTrak reduced the number of change orders from an average of 3,500 to just two — yes, two, Moore says. At $10,000 per change order, that's an estimated $35 million saved because the plant was designed right the first time.

B&V is broadening PowrTrak to include electronic data interchange connections so it can communicate with business, in addition to design, partners. The links will "connect us not

CSX's John Andrews *says moving to one global carrier would centralize negotiations across borders*

only with development partners and construction people but banks, suppliers and insurance companies — anyone who is involved in power plant construction," Moore says.

Steven Cantu

Central control. For Benetton Group SPA, the Italian clothing and accessories company, the remote location that had to be networked was headquarters itself. Housed in a 17th-century castle in the town of Ponzano, Italy, Benerton's headquarters bridges the ancient and the modern. The clothier is run as a virtual company, in which sales agents and manufacturing operations are dispersed around the world, says Bruno Zuccaro, vice president of information systems.

By using multilingual client/server applications over outsourced value-added networks that connect 30 countries, the 120 participating companies can exchange information on clients, orders and products. At headquarters, a Token Ring network over a fiber-optic backbone carries office traffic, such as clothing designs that the staff digitize and send to manufacturing plants over an Ethernet connection. "In a virtual corporation, information systems and communications are the real organization," Zuccaro says. "Communication enables us to manage all the world from this little village near Venice. We don't have to be in New York or Tokyo."

Knowledge dissemination. In the pharmaceutical industry, any improvement in communications with doctors, testing laboratories, suppliers and distributors can translate into savings and competitive advantage, says William Hoffman, project manager of electronic messaging at SmithKline Beecham PLC. Recently, however, the U.K.-based company has found a new role for its global network: collecting and disseminating information to the pharmaceutical and health care organizations that are its customers.

As a drug manufacturer, SmithKline collects huge volumes of information based on shipments and customer feedback, Hoffman reports. The company's global messaging network provides a vehicle for collecting that information efficiently and accurately. SmithKline then compiles that data, analyzes it and identifies key trends and statistics, such as the increasing demand for a particular drug or an unusually high incidence of a particular side effect. The network can then disseminate that information back to customers quickly and reliably, either as a value-added service or, increasingly, as a product that customers pay for.

Toward that end, a unified messaging infrastructure that will support a broad range of communications media and services has been in the works for several years. Now, through an open messaging infrastructure based on Simple Mail Transfer Protocol (SMTP) and X.400, the company is close to its goal. "The immediate pressure is for people to communicate with outside companies, everyone from advertising consultants to pharmaceutical suppliers," Hoffman says. The goal: a seamless, reliable, efficient flow of information that supports the end-to-end process of manufacturing, delivering and marketing pharmaceuticals. ➤➤

➤➤ **B&V's Greg Moore:** *'The biggest questions are of ownership of connections' between B&V and its overseas partners*

Customer connections. For CSX Transportation, Inc., the Internet is the newest vehicle of choice for improving customer contact. The Jacksonville, Fla.-based rail carrier is working to provide its customers with direct access to information about their shipments along its 18,000-plus miles of domestic track.

Seven of the company's largest customers are piloting an Internet-based version of CSX's Transportation Workstation, a front end that allows CSX employees "to graphically monitor shipments, trace them, find contents of shipments and look up price schedules," says John Andrews, president of CSX Technology, Inc. and senior vice president of technology at CSX Transportation; both are subsidiaries of CSX Corp. The service will enable corporate customers to check on the status of their shipments more quickly and cut costs by eliminating the CSX middleman. CSX is also testing a beta version of an Internet appliance, a barebones workstation with a World Wide Web browser, as a possible client for the service.

WEB WORRIES

While some companies are rushing to embrace the Internet, many firms still distrust it for business applications. Swissair runs a Web site with flight times, but "there is no use of the Internet for operational applications," such as those that communicate between booking systems, the airlines and the aircraft, says Edi Kaufmann, head of networking at Swissair. Those functions run on a private network. The Internet "is not reliable enough, the performance is not stable and, for operational purposes, it is not possible," he says.

That concern is echoed by Ken Garrod, managing director at Barclays Technology Services, the information technology company for international banking firm Barclays PLC. "We need to see how the Internet is going to evolve," Garrod says. "The security issues need to be resolved. It's possible that the Internet could split into two: a truly commercial superhighway and a global worldwide advertising network."

Intranets — internal networks that use Internet technologies — seem to have more universal appeal than a movement into electronic commerce, at least right now. CSX is in the process of implementing a standardized internal communications infrastructure based on Web browsers, Web servers, Usenet news servers, SMTP electronic mail and TCP/IP, Andrews says. Its purpose is to "increase an employee's ability to locate the correct piece of information or appropriate person independent of where they reside across the globe," he says. That is, zero distance between users. ●

BOEWITT *is a freelance writer and consultant in Newton, Mass.*
GORDON *is London correspondent for the IDG News Service. He can be contacted at ronzo@ax.compulink.co.uk*

Commentary

BY Leonard Kleinrock

Assembling

WE ARE BECOMING a world of plugged-in corporate nomads. More than 25% of PC sales this year will be laptops. Nomads travel anywhere and expect to be able to connect to the full complement of information technology resources that they have back home on their desktop.

At the same time, the world is becoming connected — the nomads are becoming a tribe. Through the Internet and the World Wide Web, we are enabling that tribe to connect their powerful portable platforms through a rich global network in which information is virtually free and immediacy is the standard.

But while "nomadicity" is an emerging paradigm, many enabling technologies are holding us back from realizing the full benefits. Indeed, the technologies can be more burdensome than liberating. At the same time, we all suffer from "feature shock." Most of us can't operate our VCRs, let alone understand all the functions of the latest spreadsheet, personal digital assistant (PDA) or the overwhelming options of surfing the Web.

I'm a prime example. When I travel — which is often — I typically carry a notebook computer, a cellular phone, a PDA and a pager. I often feel like Pancho Villa loaded down with all this paraphernalia, heading off to do battle with the U.S. Cavalry.

The challenge to the system designers and vendors today is to simplify the nomad's life. They must start to provide a transparent and integrated set of computing and communications capabilities and services for the nomad. I'd like the system to allow me continuous interaction with my applications and not force me to concern myself with details regarding my location; the particular communications device I am using — PCMCIA modem, cellular and so forth; the bandwidth I happen to encounter, be it 100 M bit/sec. or 0 bit/sec.; the computing platform I happen to be using; and whether or not I'm in motion.

the tribe

For example, I don't want to be bothered as the system adjusts itself to the best available communication medium; just give me the impression of continuous connectivity. If I initiate an operation such as a file update or the transmission of an E-mail message and the system chooses to defer that operation for its own reasons (lousy connectivity at the moment), I shouldn't be pestered with that fact.

But we are a far cry from that state. Instead of an integrated support system for the nomad, we're seeing rollouts of unrelated niche products. Most of the notebooks, PDAs, palmtops, pagers, cellular phones, Cellular Digital Packet Data systems, personal communication systems and personal information management systems on the market fail when it comes to interoperability.

Nomadicity is an emerging fact of life, and it is clear that our physical and logical IT infrastructure must be extended to support this mobility in a variety of ways. The needs are real, and the payoffs in terms of productivity can be huge.

But confusion reigns. And it will continue to reign until we face up to the integration challenge. The computing and communications industries must think in terms of developing products that are enabled for nomadicity. To accomplish that, we need an architectural model for nomadicity. Once that architecture is defined, we must develop the protocols that provide transparent, virtual connectivity for the nomad. The industry will have to agree on a set of standards to support those protocols, and product offerings should conform to those standards.

The time is ripe to create an industry forum that begins to consider those issues. If we fail to account for nomads at this early stage, we will seriously inhibit our ability to meet their needs of the nomad. ●

LEINROCK, *a founding father of the Internet, is a professor of computer science at UCLA, president of Nomadix LLC and chairman of the TechnologyTransfer Institute. He can be reached at lk@CS.UCLA.EDU.*

PHOTO: LARA JO REGAN/SABA/PHOTOILLUSTRATION: ERIC PRAIL

CONTROL Central

★ Technology comes but cautiously to China, where the government holds the purse strings. But fledgling networks are leading the march into the future. → By Anna Foley

CHINA IS A LAND of stark contrasts. From barren Mongolian steppes to booming centers of trade, China's population of 1.2 billion is at once progressive and traditional. The country's networking infrastructure mirrors this diversity.

On the one hand are thriving commercial centers such as Shanghai, Guangzhou and Shenzhen. All three have trial Asynchronous Transfer Mode (ATM) networks in place and plan new, innovative services. Elsewhere, however, end users must make do with public X.25 packet-switched networks for wide-area communications, or leased digital circuits that, in most cases, run at less than 2M bit/sec. They have little hope of moving to higher-speed technologies in the near future.

Developing countries are usually characterized by rudimentary communications infrastructures. But for that very reason, they are also often touted as ideal candidates for leapfrogging more advanced neighbors in adopting leading-edge technology. China is no exception.

"China is like a blank piece of paper, and Chinese people like to take the best of whatever they can. So many organizations are constructing their buildings with state-of-the-art networking in mind," says Nanying Yin, Bay Networks, Inc.'s ATM Forum representative in China.

THE COMMUNIST WAY

But China's economy isn't market-driven. Government planning and funding drive development of the network infrastructure and companies' adoption of advanced technology.

That presents problems for some firms. The government's view is that the development of the network infrastructure must be centrally controlled; with the country's limited resources, market-led development can't be allowed, notes one Western diplomat in China. In addition, he says, there's a general lack of understanding of technologies such as ATM. "It's one thing to say Chinese companies are leapfrogging the rest of the world. If they don't know how to use what they've got, then they're not leapfrogging," he says.

China has only recently installed its three national datacom networks — Chinapac, Chinaddn and Chinanet. All can be upgraded to run ATM traffic, but Chinese officials are likely to want to recoup their initial investment before committing additional funds, says Lynn Crisanti, an analyst at International Data Corp. in Beijing.

Officials from the Center for Information Infrastructure and Economic Development at the Chinese Academy of Sciences estimate that the government will need to spend $50 billion over the next five years to upgrade China's public voice network alone.

In some areas of China, however, isolated municipal authorities and telecom providers are embracing broadband ATM as a potential money spinner. Pockets of state-of-the-art network use are springing up in prosperous regions around Shanghai and in Guangdong Province, which borders Hong Kong. Those installations are providing models for other cities to follow. ➤➤

RICARDO STAMPOLI

When we go to work, we work on s
think about switching. When we ta
switching. When we eat dinner, we
about our future, we talk about swi
we go on and on about switching. When

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witching. When we eat breakfast, we
ke customers to lunch, we talk about
talk about switching. When we talk
tching. When we talk to our friends,
we go to bed, we dream about switching.

Should you come to us for switching?

Yes.

Should you come to us for a wild time on Friday night?

Probably not.

Going out on the town isn't exactly our strong suit. After all, we've spent every minute of every day for the last five years creating switches for every part of a network.

And our obsession has paid off. Our breakthrough ASIC technology has enabled os to develop products for virtually every switcbing need, whether backbone or workgroup; Etbernet or Token Ring; even FDDI, Fast Ethernet and ATM. The LinkSwitch™ 1000, with Fast Ethernet switching starting at $199* per port and the powerful LANplex® 2500, with throughput up to 565K packets per second (pps), are just two examples. And everytbing is covered by 3Com's® comprebensive Transcend® network management. The result? We're the worldwide market leader io backbone switcbing.

For help with all your switching needs, call 3Com. For information oo the hottest clubs in towo, you're on your own.

3Com®

NETWORKS THAT GO THE DISTANCE

Shanghai. "The Ministry of Posts and Telecommunications encourages local PTTs [postal, telephone and telegraph agencies] to develop new services in line with their standards, althoogh they don't give us any money for them," says Zhang Wei Hua, vice president of the Shanghai Posts and Telecom Administration (PTA)

Zhang says the Shanghai PTA has been testing ATM-based videoconferencing services between the municipal governments of Podong and Puxi since the end of 1995. It has also installed high-speed LAN-to-LAN connections to Jiaotong University. The services run on IBM switching eqoipment.

The next step will be to extend ATM service to high-income residential areas, laying a combination of fiber to the curb to buildings and hotels, Hoa says. Applications will include videoconferencing and entertainment services such as karaoke-on-demand and video-on-demand. But the PTA expects to face some broadcast regulatory issues before the commercial launch can go ahead, Zhang says.

★ A municipal project in Shanghai will provide access to databases and online services by 2010. A firewall will shield citizens from the Internet.

The PTA's ATM backbone will also form the basis for future communicatiuns in Shanghai Infoport, an ambitious municipal information infrastructure project. Due for completion by 2010, Infoport is to provide access to nine private online moltimedia databases that offer services such as finance, insurance, statistics and trade and to Shanghai On-Line, a public information network that offers access to a variety of domestic and international information systems, Zhang says.

In line with China's overriding goal of sheltering citizens from so-called harmful Internet content, however, Infoport plans to use a firewall between Shanghai On-Line and the Internet.

Guangdong province. John Ure, director of the Telecommunications Research Project at the University of Hong Kong's Center of Asian Studies, says that, as a region, Guangdong Province in the south of China is moving ahead of Shanghai. That's because advanced networking initiatives are starting to take off provincewide

For example, based on desktop ATM equipment from First Virtual Corp., Guangzhoo Huamei Communications has been piloting ATM-based videoconferencing links across the provincial capital uf Guangzhou since 1995. By contrast, in Shenzhen, the city government plans to pilot videoconferencing among 33 government bureaus by next July.

Huamei — a joint venture between U.S. partnership SCM/Brooks Telecom and a subsidiary of China's Commission of Science, Technology and Industry for National Defense — was established in 1993. It uses AT&T and General Datacom ATM equipment to provide broadband services around the city over the Guangdong PTA's fiber backbone.

The target market for Huamei's full-service network is hotels and associated office and residential blocks, says Gary Savage, Huamei's acting chief operating officer and a Brooks executive, vice president. For economic and regulatory reasons, urban commercial complexes have tended to grow up around hotel sites.

Savage's plan is to offer on-screen tourist information and near-video-on-demand to hotel guests and residents. It also plans videoconferencing in business centers with links to Beijing and, ultimately, International locations. "We're aiming to be in two or three botels, serving roughly 1,300 rooms, by the end of 1997 and in 100 hotels and 40,000 rooms by 2002," he says.

Despite detailed business plans and the experience of a U.S. partner, such ventures run the risk of investing in a state-of-the-art network and then finding few subscribers to generate incume.

The challenges are both political and econumic. But for the most part, China analysts agree, now that the doors to technology innovation have been opened, they can't be closed again ●

Greg Kopriva

Huamei's Gary Savage *plans to offer on-screen tourist information and near-video-on-demand to hotel guests and residents*

FOLEY *is associate editor at* Computerworld Hong Kong.

The INTERNET

'net *around the world*

SUSAN LEVAN

No borders, no boundaries. From Finland to Brazil, companies are leveraging the Internet and the World Wide Web to boost their bottom line.

Geffen Records: An intranet keeps this studio putting on the hits. Page 32.

Times of India: It's intranet time at India's largest daily newspaper. Page 32.

ABB: Engineers can't buy turbines on the 'net, but they can connect. Page 34.

Bradesco: The 'net forges worldwide frontiers for a Brazilian bank. Page 34.

Schwab: Bull market today? Do some trading online. Page 36.

Merita: How a Finnish bank enables direct payment over the Web. Page 36.

Seeking all the hits

Rock 'n' roll and . . . information technology.

It's a combination that wouldn't have meant anything to Buddy Holly or Janis Joplin. But at Geffen Records, IT is a central part of the rock 'n' roll mix, both on the face the company presents to the public via a World Wide Web site and internally, with an intranet.

That intranet, used for notes, plans, reports and dozens of what would usually be paper-based documents, is extraordinarily effective, executives say. "Finding stuff on paper is really hard, but on the intranet it's a lot easier," says Doug Fenske, assistant to Jim Griffin, vice president of the technology department. "You know where the information is without having to go through lots of people."

The intranet supports Geffen's corporate culture, too. Besides the usual electronic-mail services and corporate news, the intranet boasts a large number of local restaurant menus. Late-night munchies and lunches out are apparently part of the scene in the record biz.

Geffen wasn't always so cutting-edge, however.

When Griffin joined the company at the start of 1993, it not only didn't have an Internet connection, it didn't even have a LAN. Then, online services such as CompuServe let the "cat out of the bag — [staff] were finding useful information online, and they began to demand access to the outside world," he says. His first mission, Griffin decided, was to develop a technology department that would provide more than just network services.

Naturally, one of the first things the group did was set up a Web server. Its site (http://www.geffen.com), which Griffin says was the first established by a recording company, promotes Geffen's repertory of artists and lets visitors sample new releases, find out about their favorite bands and even send fan mail. It's also used to recruit artists, who tour the technology department when they visit the company.

On the internal side, Geffen's technology group had first looked at client/server to see if that architecture made

The Times, they are a-changin'

India's largest newspaper blazes new trails with one of the first intranets in the country

HERE'S A REASON to set up an intranet: collaborative thinking.

That's one thing A. K. Peter says drove *The Times of India* to take the intranet route. The New Delhi-based *Times*, the country's leading English-language news daily, launched its intranet application just last month. It is probably India's first such major intranet application.

"If somebody wants to say something, he or she can put it down on the home page. If anybody wants to react to it, they can do so," says Peter, general manager of information services at *The Times*, the flagship of heavyweight publishing group Bennett, Coleman & Co. Ltd. "It will ultimately boil down to a very efficient information system."

The Times' home page on the World Wide Web (http://www.cyberindia.net/timesofindia/home.htm) features news and general information about the newspaper and its sister publications. The intranet includes internal information in areas such as marketing and finance; it is restricted to employees.

One major use of the intranet will be conducting quarterly business reviews of the 30-plus offices nationwide. "The Web-based intranet will enable

sense. It concluded that it didn't. "With client/server you gather information, process [it] and distribute [it] — it takes too long," says Griffin. "We put the tools in their hands: Better we should teach them to fish than fish for them."

That's what led Griffin the way of an intranet, a setup that brings the Internet down to the desktop and allows any user in any department to create and manage the information themselves. (Firewalls based on custom systems control access between the Internet and the intranet.) The intranet is based on a central network at Geffen's headquarters in Los Angeles, the location of the company's main Internet gateway. From there, the intranet has links to London, New York, Chicago and Atlanta as well as 30 field offices that support about 225 users.

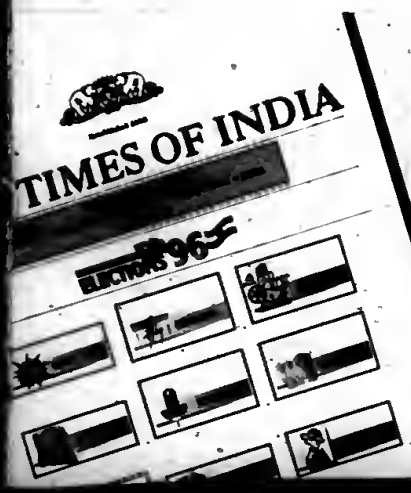
The intranet's ease of use is an important aspect, Fenske says. "When I came to this company, all I knew about was Windows 3.1. But learning to use our intranet was easy, and I can find out anything about our business that I need to know," he says.

"I think that one of the ways to find out if you are doing a good job with your intranet is to ask people in your organization who is responsible for the Web server. If they answer, 'the technical department,' you're probably not doing a good job," says Griffin. "People should say, 'me' — they have to take ownership."

For the future, Griffin says, "the objective isn't just faster and cheaper; it's focusing on doing things with the Internet and intranet that haven't been done before." Kind of like the challenge to musicians everywhere. ●

➪ BY MARK GIBBS, *a writer and consultant in Ventura, Calif. He can be reached at mgibbs@gibbs.com or (805) 644-4999.*

Lara Jo Biegun/SABA



these reviews to take place without actual physical interaction among managers," Peter says. Initial savings are estimated at $20,000 but will rise once the application is implemented across a larger number of centers.

The intranet, the brainchild of the information services division, is a logical extension of the organization's existing network, RespNet (short for Response Network). RespNet is a real-time online information service with two large networks: one for news dissemination and information sharing and one for the company's revenue/commercial departments. One of the most important applications running on the company's 4-year-old WAN, RespNet enables advertisers and advertising agencies, for example, to obtain instantaneous scheduling updates and billing and accounting information for the many regional editions of the paper.

Company sources say the intranet is the future at *The Times* and will form the basis of all internal and global communications for the organization. "It will power the enterprise," Peter says. ●

➪ BY VINITA CHAWLA, *editor of* Computerworld India.

Hitting the right Notes

ABB

Asea Brown Boveri Ltd., the biggest electrical-engineering company in the world, aims to leverage its global infrastructure to make optimum use of the Internet.

The other key part of its strategy: using the Internet capabilities of Lotus Development Corp.'s Notes 4.0. With 50,000 users (and eventually as many as 90,000), ABB's Lotus Notes setup is one of the most sophisticated anywhere.

Installation began about three years ago; the system now encompasses 750 dedicated Notes servers linked to five main worldwide network hubs. It has 300 dedicated administrators.

"Notes is a controlled and administered environment," says Bengt Skantze, group senior vice president and manager of group information systems. "And now, when I open Notes, I can click and get access to the Internet and stay within my controlled environment." That controlled environment lets ABB streamline overhead and standardize on basic communications software, even though the company is very decentralized.

Going to the Internet to exchange electronic mail and retrieve information is quite different, of course, from doing business on the World Wide Web, Skantze notes. Right now, ABB sees the Web as an information publishing medium, a way to communicate with the outside world and to steer potential suppliers and clients to the appropriate part of ABB's global empire.

Zurich-based, $30 billion ABB, born out of a merger of competing industry titans Asea AB and BBC Brown Boveri Ltd. in 1987, serves the electrical power generation, transmission and distribution markets, as well as industrial and rail transportation customers.

Its home page (http://www.abb.com) offers press releases, general information about the company and its products, and hyperlinks to individual company sites. Visitors can drill down to the level where local phone and fax numbers and sometimes E-mail links are available. But that's as far as the company is willing to go for now. "For us it's a bit more long

Banco Bradesco banks on the 'net

An 800-page Web site and home banking service put Brazilian institution in global eye

Banco Bradesco likes to be first. The largest private bank in Brazil, with assets of more than $20 billion, it was the first bank in the country to install computers in 1962. And in May 1995, it was the first Brazilian bank to go live on the World Wide Web.

The pioneering spirit to automate goes hand in hand with Bradesco's ambitious plans to be a global banking player and a domestic powerhouse. Consider that the bank has more than 20 million accounts, conducts 216 million transactions per month, adds 6,000 new accounts per day and spends about $200 million per year on information technology. "We wish to give our customers the quickest possible service," states Bradesco's CEO, Lazaro de Mello Brandao, in a recent company report.

Bradesco's site on the World Wide Web (http://www.bradesco.com.br) is part of Brandao's plan. Its more than 800 pages offer information on the bank's principal products and services, provide access to company reports and financial statements and offer access to a home banking network. The site received more than 100,000 hits in May

John Fox

BENOIT DELALOT/SABA

term. We are not an insurance company — you don't buy a turbine on the Internet," Skantze notes.

But even simply publishing information on the group home page and maintaining the hyperlinks to local-company Web sites can be a complex task for a group of some 1,000 companies operating in 140 countries around the world.

"In the beginning, it was chaotic. Everyone was out there doing their own thing, so we had to rein it in a bit," recalls John Fox, manager of editorial services at ABB headquarters.

In keeping with the decentralized nature of the company, ABB has left it up to the local companies to decide whether, and to what extent, they want to transact business on the Web, Skantze says. Those choosing to participate must follow some basic guidelines to convey the sense of a global brand. The guidelines cover such elements as logo appearance and placement, and the ratio of logo size to hot-button size.

ABB companies are also studying possible uses of intranets, but Skantze says he's dubious that a worldwide intranet will be built. Proponents say an intranet would be less complex than Notes, but Skantze says Notes is sufficient as an intracompany communications system — and one environment is preferable to two. ●

BY MARC FERRANTI, *Paris bureau chief for the IDG News Service.*

— 84% percent from Latin America, but 3.3% from North America, 2% from Europe and the remainder from Australia and the Far East, says Odécio Grejo, the bank's technical director.

Bradesco spent about $200,000 during the initial phase of the Web project and recently injected another $400,000 to expand the Internet-based home banking service, according to Bradesco Executive Director Aluizio Borges.

The home banking service, called Bradesco Net, offers interactive banking 8 a.m. to 8 p.m. weekdays. Customers can transfer money between accounts, request home delivery of checks, schedule and pay bills, check balances, obtain account statements, manage investments and use their Bradesco/Visa credit cards. All commands in the environment are cryptographically protected.

Bradesco's next Web project: an intranet. It would be an alternative to the current electronic-mail system, which has 23,000 users and handles 24 million transactions per month. ●

RICARDO AZOURY/FOLHA IMAGEM

Aluizio Borges *says Bradesco spent about $200,000 in the initial phase of the Web project*

BY MEYRIANE TABAK, *executive editor of Connections, an IDG affiliate in Sao Paulo, Brazil.*

Merita

FINLAND LEADS THE WORLD in per-capita access points to the Internet. Yes, Finland. In fact, with only 24 people per 'net host, the nation blows away nearest competitors Sweden and Australia, which are tied with 59 people per access point, according to Killen & Associates in Palo Alto, Calif.

So maybe it's no surprise that Merita, the biggest bank in Finland, is one of the first banks in the world to offer electronic fund transfers directly from client to customer over the Internet. And Merita Bank Ltd. is also creating an intranet and planning to put other banking services on the 'net.

The Finns are a receptive lot for such experiments. "In all forms of networking, Finland is a kind of laboratory, and so Internet payment is the tip of the iceberg," says Kalevi Kontinen, the head of Merita data systems in Helsinki. Why? "The Finns are rather solitary and independent, and if anybody gives them a choice to do something themselves, they like to do it," he explains. "The Finns are also real techno-freaks, and they are quick to jump on the latest gadgets."

Merita's Internet payment service is connected to an electronic-cash system called E-cash. Provided by Netherlands-based service provider EUnet NV, it was developed by DigiCash, Inc. in New York. Participating vendors display a button marked Solo on their payment screen.

To use the service, Web shoppers simply fill out the vendor's usual payment form and click on the Solo button. That

brings up the Solo payment screen, on which users type in their account numbers and a one-time, four-digit code. When the user presses the "OK" button, Merita debits their bank account and credits the vendor account with the payment for the order. Right now, users must be customers of the bank, and due to international banking laws, both parties involved in the transactions must be in Finland. So far, 11 Internet vendors offer the Solo payment option, and 100 more have requested it.

Merita is further leveraging its Internet know-how to develop a user-friendly enterprisewide information system. Tests of the intranet will start in the third quarter, and users will be trained by the end of the year, Kontinen says. ●

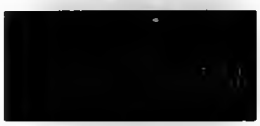
➡ BY MARC FERRANTI, *Paris bureau chief for the IDG News Service.*

Schwab

Time is money,

and nobody knows that more than financial services companies. So when the Internet took off months before Charles Schwab's Web site was scheduled to debut, the company accelerated its program. Time to new site: three months, from concept to operation.

Schwab Online (http://www.schwab.com) executes stock trades and confirms them with the client within 60 seconds. It also tracks portfolios in either delayed or real-time mode, depending on the type of account. Clients must use a se-



cure browser, such as Netscape Navigator or Microsoft Internet Explorer, so transactions can be kept private.

"Schwab has always believed that information technology is the best route to providing better service at lower cost — and the Internet is an ideal service medium," says Gideon Sasson, senior vice president of electronic brokerage technology at Schwab.

Schwab Online, the first service of its kind among the big brokerages such as Fidelity and Grubb & Ellis, debuted in March. It's not Schwab's first electronic effort, though. Schwab introduced a dial-up trading service, StreetSmart, in 1995; all its customers can use it, whether they have regular accounts or electronic E-Schwab accounts. (Regular accounts allow the use of branch offices and telephone-based services; E-Schwab accounts use online services only. The E-Schwab service carries a 10% discount on trading activities.) StreetSmart uses proprietary software; the Web-based brokerage uses back-end applications that Schwab can upgrade on the fly and enhance as needed.

Though it won't disclose numbers, the brokerage says Schwab Online is already profitable enough that the company is moving into the next round of development. The next iteration will add improved graphics and other features that Schwab officials are hesitant to discuss.

"You'll see Schwab focus more and more on the Internet as a way of providing increased value to our investors," Sasson says. "I don't think it's an issue anymore whether there will be an online economy — it's just a question of details and how fast it will happen. Financial services are going to lead in giving users a real reason to use the Internet." ●

➡ BY MARK GIBBS, *a writer and consultant in Ventura, Calif. He can be reached at mgibbs@gibbs.com or (805) 644-4999.*

Commentary

BY JAN HERTZBERG

Latin flavor

AS IN MANY PARTS OF THE WORLD, the popularity of the Internet in Latin America has grown dramatically. Large banks, government agencies and newspapers have been leading the way in offering services on the Web, and now many small entrepreneurs are starting to sell products over the 'net. Electronic malls, some operated in the U.S., provide a forum for businessmen to sell everything from tapes and CD-ROMs to specialty foods. One even has a directory of Brazilian restaurants.

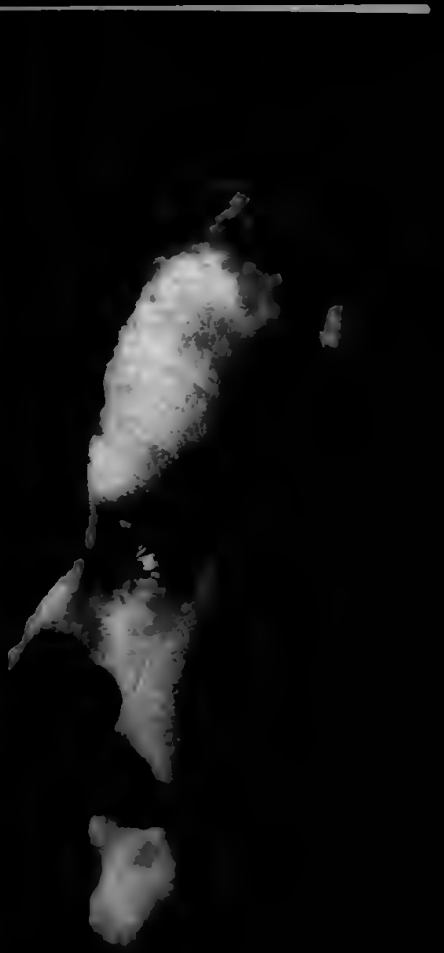
But the greatest value of the Internet to Latin American businesses is not as a commercial medium. It is in providing a global communications infrastructure that will enable them to distribute and extend IT services, such as E-mail and distributed applications, to remote offices, distributors and business partners. Unlike U.S. carriers, Latin telcos have traditionally offered unreliable and expensive data and voice communications services. If used as part of an overall IT strategy, the Internet will eventually help level the playing field by providing global, reliable services at a fraction of the cost of private data networks.

But while the Internet holds great promise, there are some significant inhibitors:

- In many Latin countries, universal access is far from universal and robust telco infrastructure remains spotty.
- To date, Internet usage costs in Latin America have remained high, especially compared with those in the U.S., due in large part to expensive local dialing rates.
- Latin American businesses often lack the back-end links that allow them to easily exchange transactions with one another. In the U.S. and elsewhere, transaction networks are the workhorses that facilitate the exchange of purchase orders, invoices and other documents.
- Significant language and cultural obstacles must be overcome to make Latin American Web sites attractive to non-Latin users. At a minimum, home pages must be available in English, the lingua franca of the Internet.

In time, many of these obstacles will be addressed. With the privatization of national communications infrastructures and the entrance of large, global Internet service providers in the region, competition will force improvements in service and reduce prices. Transactions will be made easier through common Internet procotols, improved systems integration and Web application development tools. Those tools will also enable Web developers to create applications in different languages, enhancing their appeal. ●

➡ HERTZBERG *is a manager for the Center for Technology Enablement at Ernst & Young in Chicago. He can be reached at Jan.Hertzberg@ey.com.*



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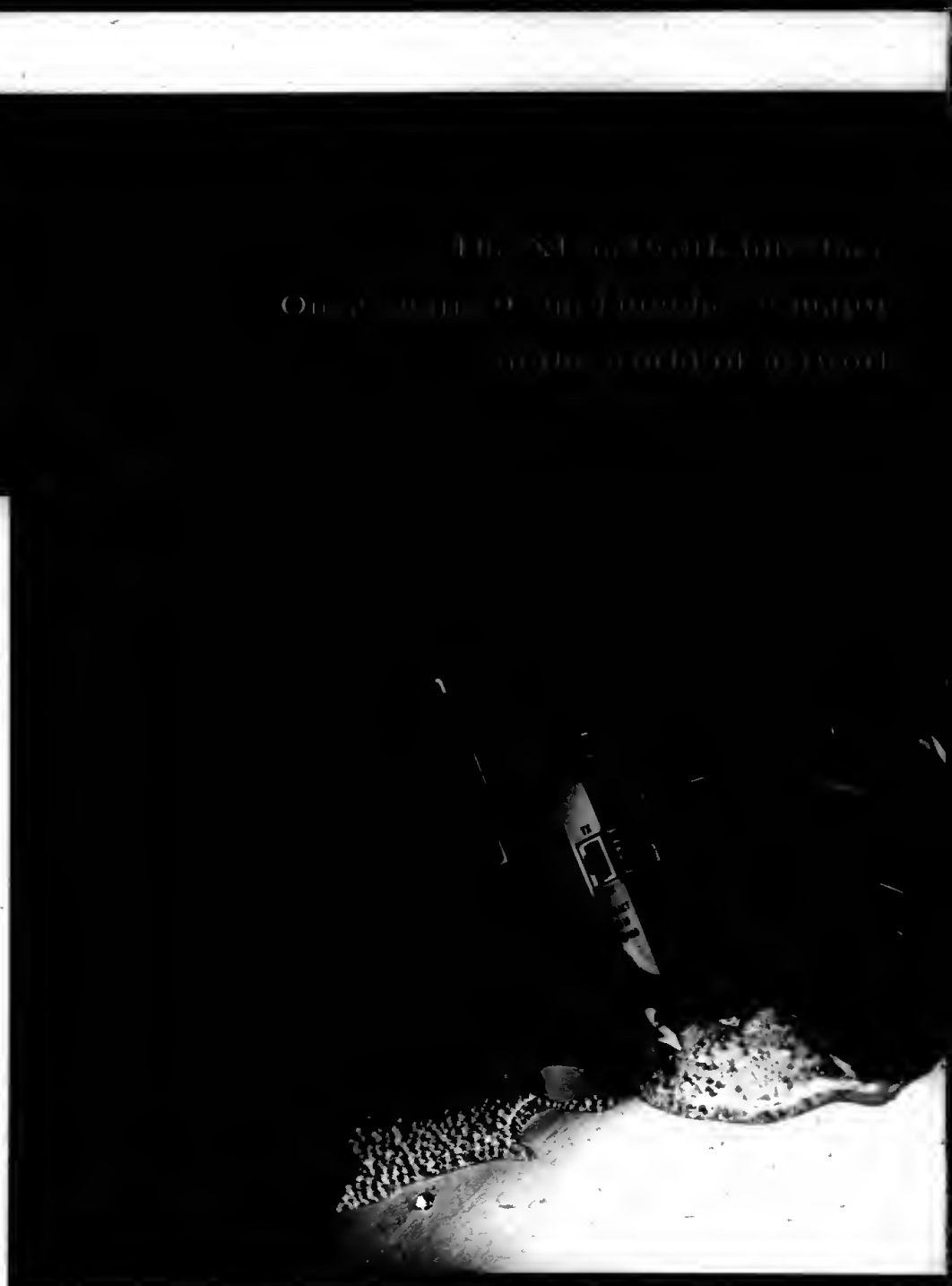

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extreme

From the South China Sea to Egypt's Sahara Desert, an oil company must have seamless communication around the globe. It's the price of doing business.

ON AN OIL PLATFORM 300 miles off Mexico in seas thousands of feet deep, Amoco Corp. networking technicians quietly installed the future. It was late 1994, and the future took the form of floating, high-end servers and networking gear that could talk to a NASA test satellite.

The mission: To beam multimedia seismic data collected from beneath the ocean floor directly to supercomputers in the U.S. at T1 (1.54M bit/sec.) speeds in a special demon-

stration for the federal government and the public. In production mode, this system would save Amoco millions of dollars by speeding up data collection decisions and ultimately allowing the $30 billion firm to re-engineer the way it dispatches ships for more accurate drilling.

The event marked the birth of an industry-pioneering project to unite users, equipment makers and network service providers in perfecting the much-hyped, but little-deployed, Asynchronous Transfer Mode (ATM) technology. ATM is a high-speed packet-switching technology that packs bits into fixed-length cells.

→ BY Joanie Wexler

Conceived to run at 45M bit/sec. and faster, ATM is often viewed as nirvana for mixing voice, data and video onto one network. One primary appeal of ATM applications like Amoco's: Equipment scales easily and inexpensively to higher speeds as traffic expands, says Carl Williams, Amoco's chief information officer.

Since the the Gulf of Mexico demonstration, the Amoco project, dubbed the ATM Research and Industrial Enterprise Study, or ARIES, has produced two other demos and grown to include the entire petroleum industry, which hopes to collectively save tens of millions of dollars one day by using ATM technology.

In the second demo, in the fall of 1995, also from the fixed platform in the Gulf, the speed of the transmission link jumped hundredfold, to 155M bit/sec. And this past February, the group demonstrated the shipment of seismologic data gathered off a moving vessel in the Gulf of Mexico to the Minnesota Supercomputing Center in Minneapolis. Because the vessel was moving, the speed of running the ATM protocol over NASA satellite links dropped to 2M bit/sec. The first demonstration used a General DataComm Corp. Apex ATM switch with a T1 interface, but subsequent trials used Fore Systems, Inc. ASX 200 switches with higher-speed interfaces, says David Beering, a senior staff telecommunications analyst at Amoco.

AMOCO HASN'T LIMITED its trailblazing networking efforts to ARIES. With operations that stretch from the frigid North Sea to the Egyptian desert, Amoco has also been instrumental in helping bring new services to out-of-the-way places. ➤➤

Paul Bielenda

Amoco has embarked on a two-year plan to move to an ATM switched network. "We hope to reduce complexity by collapsing many networks into one." — CARL WILLIAMS

The company has used its clout in other countries and their phone companies, for example, to test new network services. One result commercial Integrated Services Digital Network in Malaysia

In oil-rich Egypt, Norway, Trinidad and Tobago, where Amoco has large operations, the company "purchased earth stations with more capacity than we needed" and is reselling services to others, says Alex Gonzalez, manager of Amoco's international communications. Gonzalez manages satellite networks that serve 16 countries and run at speeds up of to T1

Private satellite and terrestrial nets have often been more cost-effective in many parts of the world where monopoly phone companies reign. Gonzalez estimates the company saves at least 50% by running private lines and compressing traffic.

Where public services are economical, Gonzalez has deemed frame relay the Amoco standard. He uses services from Concert — a joint venture between MCI Communications Corp. and British Telecommunications PLC — in Hong Kong, the location of the company's Far East chemical headquarters. He uses Scitor Corp., an international carrier, in Europe.

"No matter how remote workers are, you have to provide telecommunications services," Gonzalez says. In the South China Sea, for instance, floating platforms, tankers and facilities on the mainland communicate via microwave and satellite. The tankers run LANs and private branch exchanges (PBX) for communications.

Amoco has an unusual setup in the North Sea whereby it uses a scheme called tropospheric scatter to communicate wirelessly from Scotland to an oil platform. Tropospheric scatter is a point-to-point technology that works like microwave but isn't limited to line-of-sight transmission, Gonzalez explains. It can deliver communications as far as 500 miles by using Earth's troposphere as a big mirror to reflect signals between two points.

"This has the capability of connecting with various platforms and could provide a means of serving more than just Amoco" at some point, he says. U.K. carrier BT manages the network for Amoco, Gonzalez says.

ARIES is still the most dramatic example of Amoco's initiative to break ground with networking technologies that should eventually deliver significant payoffs for Amoco and others.

Under the tutelage of telecom analyst Beering, ARIES participants are weathering the bumps and bruises of equipment interoperability and applications testing with ATM suppliers, which include seven carriers and three switch-makers. Getting those growing pains out of the way will go a long way toward greater acceptance of the complex multimedia network.

ATM will slash seismologic decision making from weeks to hours, Beering says. Every month eliminated from a survey — and one can take months — saves about $200,000, Beering says. The industry runs several hundred surveys each year.

The goal is to transmit data — up to a terabyte per week — collected from underwater test equipment directly from exploration vessels to supercomputers. The data travels via high-speed ATM over satellite links from ship to shore, then over fiber for the terrestrial leg of the trip. "I see the [ARIES] network growing into a utility that eventually becomes an energy industry Internet," Beering says.

In addition to the ship-to-shore data transfer, ARIES is honing ATM gear into what will become a high-speed terrestrial backbone for the oil community, which Beering expects to be in place in about a year.

The modus operandi in the energy industry has traditionally been to store data on magnetic tapes that fill cratefuls by the time the ship docks. Then explorers send the piles of tapes via courier to a supercomputing center for processing. But the time-consuming task of converting data from tape to disk must happen first. It can take weeks or months from the time the data is collected for it to show up on the computer; all the while, oil vessels could be drilling in barren areas.

Transporting data to the supercomputers directly from a ship-based satellite dish should enable geophysicists to see where oil lurks and decide almost simultaneously where to send ships and how long to drill, the ARIES tests have shown.

In May, Amoco completed its internal ATM pilot and began a two-year plan to move the company off its

time-division multiplexer (TDM) network in the U.S. and onto an ATM switched network. That will be the start of Amoco's "shift from a private wide-area network to networks based on public services," CIO Williams says.

The network goal, he says, is to "move bandwidth management headaches off our backbone into the carrier's" in an era when the World Wide Web, intranet access, Lotus Notes database replication, desktop video-conferencing and other applications stress bandwidth. "We hope to reduce complexity by collapsing many networks into one that is scalable [to higher speeds] simply by making a phone call to the carrier."

STARTING this summer, Amoco's Cisco Systems, Inc. router network will detach from the Network Equipment Technologies, Inc. IDNX T1 TDM backbone; LAN traffic will feed from the routers into ATM switches, Beering says. Later this year, the company plans to unplug its PBXs from the IDNX and send voice on its way over the public-switched telephone network.

And last but not least, the IBM 3275 and 3745 front-end processors will eventually drop off, no longer single-handedly cost-justifying an entire TDM network themselves; SNA will hop on the ATM net as well. At that point, Amoco sites in Chicago, Atlanta, Houston and Tulsa, Okla., will plug into an ATM "cloud," or public ATM network service.

"Carrier-based ATM has great potential for replacing TDM," says Tom Pecelunas, supervisor of network services at Amoco's Chicago headquarters. "The cost per bit over ATM is cheaper, and we now have significant expertise built up in-house with ATM" because of ARIES.

Pecelunas says a frame-relay/ATM hybrid net in the U.S. is on the horizon: Frame relay, which is optimized for data, will fit the bill for sites with low to medium traffic, and ATM will carry higher-speed applications for those that mix voice, video and data, he says.

Still, on a worldwide basis, getting uniformity across services is tough. Amoco Chemical Asia-Pacific in Kuantan, Malaysia, was a guinea pig for Telecom Malaysia frame-relay services, says Ken McDaniel, Amoco's information technology operations supervisor. "But we just couldn't get a reliable connection up," and the project has been put on the back burner, he says.

And in sub-Saharan Africa, virtually no data services exist, Gonzalez says, and satellite service is cost-prohibitive. The company runs only business offices there, and they communicate by the dial-up phone network. But knowing Amoco's commitment to technology and influence, many Africans might soon be conducting Notes-based collaborative data conferences. ●

➡ **WEXLER** *is a senior editor at* NetworkWorld *in Sunnyvale, Calif. She can be reached at jwexler@nww.com*

ARIES

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PAUL BLESSER

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WEELER *is a senior editor at* NetworkWorld *in Sunnyvale Calif. She can be reached at jweeler@nww.com*

Brewing up ARIES

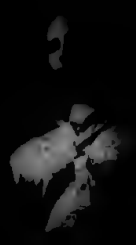
H[illegible] into asynchronous Transfer Mode (ATM)? As David Beering, a senior staff telecommunications analyst at Amoco, tells it, the saga officially began at the Golden Gateway Brewery in San Francisco, a casual hot spot where Silicon Valley product plans take shape, engineers find jobs and masses of industry lowlife are launched.

That is where "networking" — of the personal variety — paid off for Amoco.

Beering was seeking [illegible] high-performance network to hasten [illegible] business. Among agenda [illegible] on explorations, and he says [illegible] slash those costs. [illegible] distance, one way to do that with [illegible] ways.

He [illegible] the $700 million, 6000[illegible] Technology Satellite, and another [illegible] the Department of Energy's [illegible] Gulf. Beering and his Seattle organization [illegible] vice director of distributed computing, met at [illegible] satellite model on a cocktail napkin and [illegible] NASA.

Two years later, [illegible] the $1 billion ARIES test network up and running. — *Jennie Washer*



Networking a nation

Electronic banking is taking off in South Africa. One target audience: the 'unbanked' rural population

→ BY Simon Cashmore

THE TERRAIN of the KwaZulu Natal is hilly, with frequent mist and lush vegetation. The region's remote, rural communities have few, if any, modern services: Paved roads, running water and telephone service are rare. Political violence between members of the African National Congress (ANC) and those of the Inkatha Freedom Party has racked the area in recent years, resulting in banditry and bloody feuds between communities.

Until recently, a pension-payout vehicle would arrive every two months to give residents of retirement age (60 for women, 65 for men) their government stipend of 300 rand (about $67). Pensioners would wait for hours for the vehicles to arrive; then they'd wait some more as IDs were checked and verified.

A program called Cash Paymaster Services (CPS) from First National Bank has brought a piece of the late 20th century to all that. The pension vehicles that arrive now are security trucks outfitted with modified automated teller machines (ATM). And the lines move quickly: The ATMs identify pensioners by their thumbprints, so all a person needs to do is place his thumb on a biometric reader. The system also cuts down on fraud. Since it was introduced, the number of people who receive payments has dropped by 20%.

CPS was pioneered by the bank in conjunction with local information technology group Datakor. The bank's most adventurous remote banking project, it has attracted considerable interest among regional and local government organizations eager to provide basic financial services to rural and largely illiterate communities.

The South African banking industry is undergoing a profound transformation driven by powerful social, economic and technological forces. Until recently, apartheid, poverty and high bank fees had excluded most blacks from the industry. For example, an ANC spokesman estimated that, until the general election last year, only 5% of the total value of housing mortgage bonds granted by banks had been awarded to blacks. He also estimated that less than 25% of adult blacks in metropolitan areas had ATM cards and that only 1% held a credit card. South Africa's black adult population is about 20 million; blacks account for 75% of South Africa's total population.

To this enormous "underbanked" population banks are launching extensive initiatives — access to loans, develop-

→ First National Bank's *pension payout vehicles include biometric readers that identify recipients by their thumbprints. The vehicles serve 500,000 retirees in KwaZulu Natal.*

ment funding, savings and investment mechanisms, and provision of cash payment and transaction facilities.

"While South Africa reflects world banking trends, we are also faced with uniquely local challenges. The bulk of the population is 'unbanked,' with 80% of all transactions still taking place in cash. So the challenge is to take banking to the people," says Mike Jarvis, First National Bank's general manager responsible for information technology. "The business of banking is all about information and being able to deliver that information where and when it is needed."

ON THE HORIZON

Outreach to the black community isn't the only challenge that faces South African banks. The need to broaden the range of personal and corporate services and counter increasing competition from local and international institutions is up there as well. The face of banking is changing. For the first time this year, for example, First National will generate more income from services and transaction fees than from its traditional lending business.

And bank services demand networking. ATMs, branches and remote banking devices on the premises of corporate customers have all become a part of doing business.

First National recently spent 250 million rand (about $56 million) to automate branch offices. The four-year project involved installing more than 10,000 IBM PS/2s and an OS/2 client/server environment at 620 branches; the PCs are interlinked at the branch level on Token Ring LANs and integrated into the bank's national network. The project enabled the bank to centralize routine back-office transaction processing operations so that counter staff, equipped with online systems, can spend their time selling products.

➡ Security trucks *outfitted with modified automated teller machines make the trek to rural KwaZulu Natal to distribute government-funded pensions to retirees*

ON A WIDER SCALE

In some instances, the need to offer services has brought the industry together. And cooperation is growing. South Africa's Saswitch national ATM-sharing network enables a customer to access his account by using any of the 6,000 ATMs around the country, regardless of which financial institution holds the account.

Those ATMs are integral to the banking scheme of a nation where most transactions are still conducted in cash. Other services are sometimes a harder sell and call for some creative solutions. How do you approve a loan for someone who doesn't have a credit history? Examine their standing and accountability in the community instead. That's what First National Bank is doing.

It's a challenge. And a step toward economic progress. ●

➡ **CASHMORE,** *a freelance information technology journalist, is a regular contributor to* Computing South Africa, *an IDG affiliate. He can be contacted at simon.cashmore@it-media.co.za*

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MANAGEMENT SMALL BUSINESS SOLUTIONS

NETWORKS THAT GO THE DISTANCE

The Network 25 are companies from around the world that use networking in innovative ways. This list, compiled by *Computerworld* and *Network World*, is not a ranking. However, all nominees were surveyed on their information systems and networking expenditures and asked for the breakdown of those budgets. Total spending was one of several factors used in selecting the 25 companies featured. Excerpts from the Network 25 survey results appear in the following charts.

ABB	$850M	$250M	35,000	480
Amoco	$401M	$62M	2,409	128
Banco Bradesco	$334M	$112M	1,920	200
Barclays	$145M	NA	6,890	NA

NA=Not available

METHODOLOGY

The 25 companies on this list were selected through nominations by the editors of *Computerworld* and *Network World* in the U.S. and at sister publications overseas (see page 3). Any organization could be nominated except computer hardware, software and telecommunications companies.

Editors in the U.S. developed a set of seven technology areas by which editors from around the world could evaluate the companies (see page 7). Editors were asked to select companies they believed were outstanding in one or more of these areas and to provide some details for their nominations. Once the nominations were compiled, *Computerworld* researchers asked IS managers at the companies to provide more information for further evaluation. Companies with higher relative spending on networking, for example, were given greater weight.

Also, companies that refused to participate in the survey process were excluded from consideration. This requirement effectively eliminated a number of candidates, including the finalists from Japan.

While we were looking for outstanding companies, we also wanted a fair representation from around the world. Therefore, U.S companies account for 24% of the list, Europe accounts for 36% and the rest of the world accounts for 40%.

It should be noted that this list is not a ranking, and it is not intended as a definitive list of the "best" networked companies in the world. Rather, it was compiled as a representative list of innovators that are applying networking technology.

20%	5%	3%
7%	10%	1%
4%	80%	1%
NA	NA	NA

Snapshots

CEMEX

Jose Luis Luna, director of evolution and technology at Cemex, a cement and building aggregates producer in Monterrey, Mexico, has employees devoted to analyzing new technologies. The result: initiatives such as Cemexnet, the company's domestic network established in 1988 to facilitate communication among plants throughout the country.

LUNA

It has since expanded to reach sites in Latin America and Europe. The technology used for the network varies by region. In Latin America, Cemex uses time division multiplexer satellite networks; in Europe, fiber-optic networks. Electronic mail and groupware applications run through these networks, which support TCP/IP, IPX and SNA traffic. A desktop videoconferencing network, now being installed, will connect systems throughout the world via an ISDN gateway, Luna says.

FACTOID

CEMEX started one of the first satellite networks in Mexico in 1988.

Cervecerias Quilmes

With six breweries and four distribution centers, Cervecerias Quilmes is the top brewery in Argentina. Its in-

MORE ▸▸

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Black & Veatch	$46M	$7M	400	30
Cemex	$30M	$20M	275	40
Cervecerias Quilmes	$5M	$2M	34	15
Charles Schwab	$120M	$70M	560	260
CSX Corp.*	$300M	$81M	1,183	305
Federal Express	$525M	$220M	3,880	320

*Includes CSX Transportation

20%	10%	2%
10%	20%	10%
20%	15%	10%
47%	32%	2%
28%	50%	5%
18%	14%	0%
15%	25%	8%

CERVECERIAS QUILMES

ternetworking structure supports 700 sites; its 25 servers handle the business, admioistrative, production and Internet/intranet systems.

In January, the brewery began an Internet/intranet project that allows it to exchange data with its distributors; it hopes this will improve the flow of information. So far, the intranet is handling 35% of the information on product lists, prices, advertising supplies and the status of accounts and trucks; the rest is conveyed by phone. The brewery plans to have all distributors on the network by the end of the year.

FACTOID

Cervecerias Quilmes was the first company in Argentina with an intranet, says IT chief Aldo Gianelli.

GIANELLI

This type of networking strengthens business relationships. "The distributors perceive that Quilmes is something open. They can interact with the areas they need, whenever they need," says Aldo Gianelli, IT and services chief for the brewery.

FedEx

Federal Express Corp. doesn't waste any time. Ten minutes after a package is delivered, the compaoy's database contains confirmation that the package reached its destination. How is that possible? Start with a network that supports more than 500,000 devices. "All we are is a series of networks, airplanes and vehicles that work together to move the product and information. Every aspect of the business is orieoted around the network strategy," says Winn Stephenson, vice president of network computing at the Memphis-based firm.

STEPHENSON

FACTOID

The average number of electronic transactions a day at FedEx totals more than 60.5 million.

Technology also now allows customers to track their packages without calling FedEx. Based on the size of their company, customers receive a configuration of a system called Powership. A large company, for instance, may have direct electronic data interchange links to a FedEx computer; a smaller office might use Windows-based software. Powership generates labels and places the information in a FedEx database for billing, tracking and traciog, according to Stephenson; 60% to 70% of orders are now processed this way. Eventually, FedEx plans to have 100% of its transactions handled electronically. Users can also connect via the Internet and check a package's status on FedEx's Web site (http://www.fedex.com).

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First National Bank	$168M	$29M	1,273	99
Fisher & Paykel	NA	$3M	80	8
Geffen Records	$1M	$1M	7	7
Maruti Udyog Ltd.	$5M	$1M	82	5
Merita Bank	$190M	$50M	600	50
National Computer Board	$108M	$5M	600	30
Petrobras	$375M	$120M	1,969	792

NA=Not available

25%	61%	0%
50%	25%	2%
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34%	2%	1%
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85%	13%	2%
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Fisher & Paykel

IF IMITATION is the sincerest form of flattery, New Zealand's Fisher & Paykel should feel honored. A U.S.-based appliance company emulated Fisher & Paykel's method of compressing product cycle time to reduce cost and improve performance. What enables that method to work is the company's data network, which creates a "flexible real-time scheduling environment," says David Main, network manager. The company manufactures a range of products, including refrigerators, dishwashers, humidifiers and factory control systems.

MAIN

FACTOID

Fisher & Paykel's whiteware factories are capable of modifying production within 20 seconds.

Using networking technologies such as Asynchronous Transfer Mode, Fiber Distributed Data Interface and Integrated Services Digital Network, Fisher & Paykel's network is flexible. "Our current network configuration provides seamless access for any user to any application/database from anywhere at any time, with constraints placed on access privileges for data security," Main says. Global users range from retail dealers, who use terminals to place orders, to engineers, who use high-powered CAD/CAM systems to design products.

National Computer Board

THE NATIONAL COMPUTER BOARD'S mission is to make Singapore an "intelligent island" by the year 2000. The board, created in 1981 to drive the nation into the Information Age, is now developing a multimedia broadband network called the Singapore One Network for Everyone, or Singapore ONE. The objective is to create an infrastructure that connects several local-access networks so that, effectively, one network links the island. It will carry commercial and governmental services, from high-speed Internet access to teleshopping.

FACTOID

Singapore ONE is "government-encouraged, but industry will build and operate [the infrastructure]," notes Michael Yap, a board director.

"By linking all the government departments, the various value-added networks, the offices and homes electronically, we are moving toward our vision of providing one-stop, nonstop government services to the public," says Goh Beng Tan, a board director.

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Schindler Informatik	$90M	$13M	460	36
SmithKline Beecham	$300M	$100M	2,500	100
START Informatik	$127M	$52M	150	100
Swissair	$190M	$45M	880	61
Tempus	NA	$1M	6	14
The Times of India*	$3M	$1M	75	15

* Figures for parent company Bennett, Coleman & Co. NA=Not available.

15%	15%	1%
35%	35%	1%
25%	10%	1%
1%	80%	0%
10%	87%	1%
6%	38%	8%
20%	35%	10%

START Informatik

FICHT

TRAVEL AGENCIES in 16,400 locatioos throughout Germany can book reservations and handle payments for everything from railways to hotels to tours with START Informatik GmbH's travel distribution system, called START. During peak hours, the system handles 318 transactions per second.

The company's WAN is an X.25-based network that connects oearly all of the travel agencies in Germany to START's central system in Frankfurt, says Roland Ficht, head of the production and network division at START Informatik, which handles the networking aspects of the system. The system itself is owned by parent company START Group. The router network has limited TCP/IP connections, though the oompaoy is considering increasing the number of connections. It also is considering an intranet, "to increase the efficiency of internal communication and exchange of information," Ficht says.

FACTOID

More than $10 billion worth of tickets, invoices and the like are issued each year via START.

Tempus

IT MAY NOT BE SOMETHING made out of nothing, but the information oetwork that connects three Bulgarian universities was made out of very little. As EU Tempus project members say, "to design a good network with a bulk sum of money is well done engineering; to design the same network with a lack of money is simply art."

Members of the project, which is part of the European Union program in the Trans-European Cooperation Scheme for Higher Education, used existing equipment but new technologies and mostly donated resources to get started last year. That's when they installed network backbones at the three Sofia-based schools: The Sofia University St. Kliment Ohridski, The Technical University at Sofia and The University of National and World Economy.

FACTOID

With just $750,000 to connect the universities to the Bulgarian Academic Network and the Internet by 1997, EU Tempus is counting on volunteers and good management.

Now, teachers and students can use the system for educational and research purposes.

The oext phase is to connect the schools to the national Bulgarian Academic Network and the Internet. In all, 11 universities and research institutions sponsor the project through donations of money, time and training. ●

SNAPSHOT INFORMATION *compiled by Amy Malloy.*

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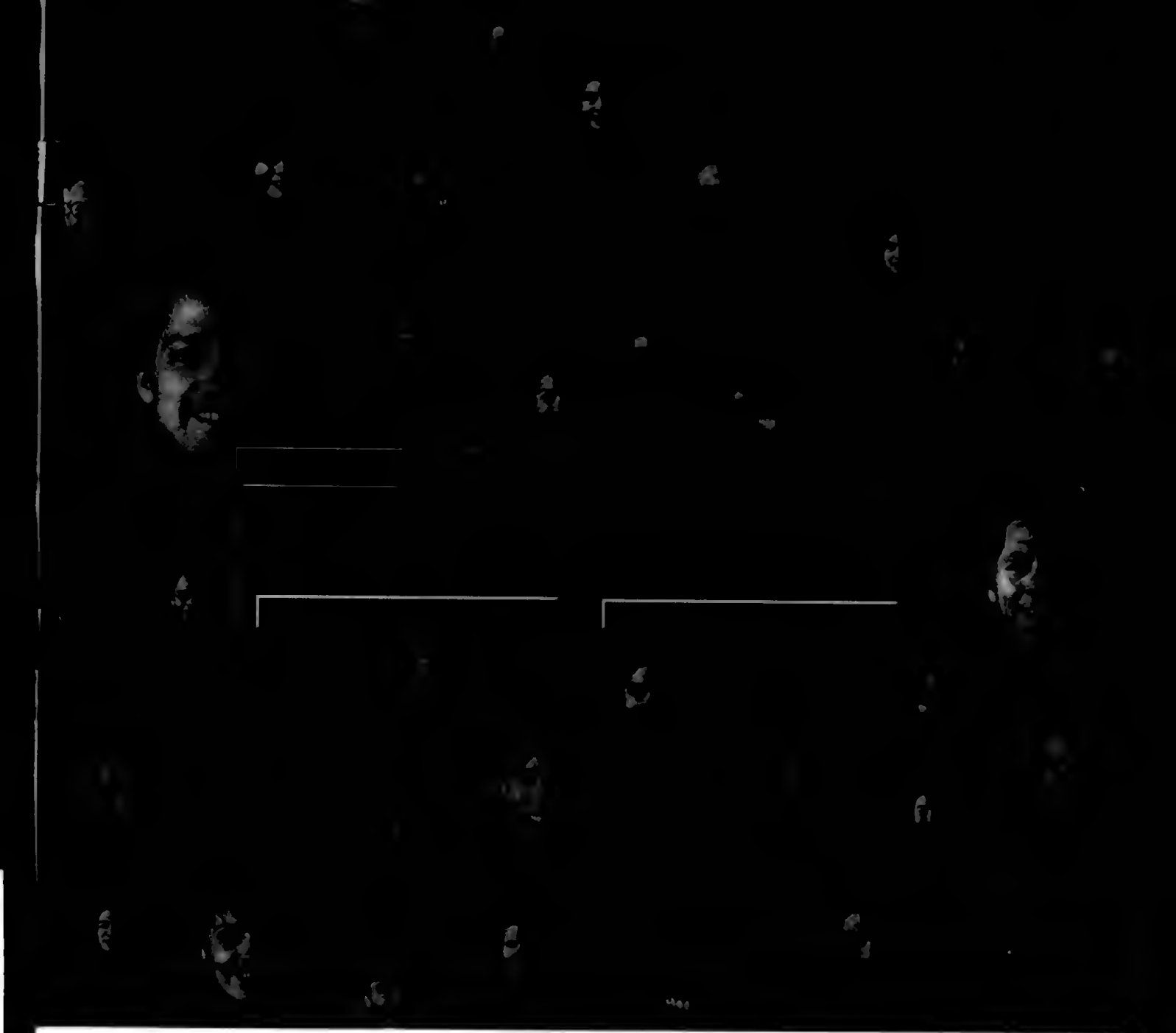

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